Access System Centum 56 Series

AS56 and AS56^{Plus} User Manual

Access System 56 CSU/DSU
Access System 56^{Plus} T1 CSU/DSU

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Unpacking

This equipment is normally shipped in cardboard cartons with foam inserts to protect the units from shock and vibration during shipment. Upon arrival of the equipment, inspect the condition of the boxes and compare all items to the packing list.Notify Verilink and the carrier immediately if there are any damages or shortages.

Store the cartons and packing material in case the unit has to be shipped at a later date.

Check the contents against the packing slip. For each Centum 56 Series unit ordered, the carton should contain the unit, an AC power module, and a manual.

WARNING

The following rules should always be followed when connecting telephone equipment and/or wiring:

1. Never install telephone wiring during a lightning storm.
2. Never install the telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

NOTE

Verilink reserves the right to incorporate product enhancements and/or change product specifications at any time and without notice.

Warranty

All Verilink equipment is covered by a 5-year new product warranty. For additional information, call 1.800.VERILINK.

FCC Information

This equipment complies with the requirements in Part 15 of FCC Rules for a Class A computing device. Operation of this equipment in a residential area may cause unacceptable interference to radio and television reception, requiring the operator to take whatever steps are necessary to correct the interference. Verilink shielded cables should be used with this unit to ensure compliance with the Class A limits.

This equipment meets the technical criteria specified in the Part 68 rules, sub-part A through F, (for connection of terminal equipment to the telephone network) as well as the requirements specified in AT&T Technical Publications 62411, 54016, and 54019A (ESF).

This equipment meets the safety requirements of the Underwriters' Laboratories (UL) technical publications UL 1950.

Type of Interface	1.544 Mbps Digital Channel
Facility Interface	04DU9-B for D4 format 04DU9-C for ESF format with AMI Line Code 04DU9-S for ESF format with B8ZS Line Code
Service Code	6.0N
Jack Arrangement	RJ-48C
Ringer Equivalence	N/A

FCC User Requirements

The following instructions are provided to ensure that you comply with the Federal Communications Commission (FCC) Rules, Part 68:

1. All direct connections to the T1 digital lines must be made through standard plugs and jacks furnished by the telephone company. no connections can be made to party lines or coin lines. Before connecting your unit, you must do the following:

    a. Tell your local telephone company that you have an FCC registered device that you wish to connect to the company's lines. Provide the 14-digit FCC registration number listed on the label. The telephone company will also need to know the facility interface code (04DU9-B) and service code (6.0N) in order to connect the necessary service.

    b. Inform the telephone company that you wish to use the RJ-48C jack arrangement.

    c. After the telephone company has installed the RJ-48C jack, you may connect the CSU with the appropriate cable.

2. If the unit appears to be malfunctioning, it should be disconnected from the telephone line until the source of the problem is confirmed. If the unit needs repair, it should not be reconnected until after the repair is completed.

3. The CSU has been designed to prevent harm to the DDS or T1 network. If the telephone company determines that it is exceeding tolerance parameters, they are permitted to temporarily disconnect service. When possible, the customer will be given advance notice.

4. Under FCC Rules, no customer is authorized to repair the equipment, regardless of its warranty status.

5. If the telephone company alters the equipment in a manner that will affect its usage, advance notice must be given to prevent service interruption.

Normally,Verilink CSU equipment will be used to interface either FCC registered or grandfathered digital terminal equipment to the digital service channel. If the equipment to be connected is not of this type, institutional procedures provide that an affidavit be supplied to the telephone company. This affidavit must state that the system will be

operated only by trained individuals and that the signal power at the telephone company interface will not exceed the limits set forth in Part 68 of the FCC's Rules and Regulations.

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Chapter

1

Overview

The Access Syst em56 Super Rate Digital Network CSU/DSU provides the interface between customer equipment and 56/64 kbps service, or full or fractional T1 facilities. It has a built-in 56/64 kbps CSU/DSU, a built-in T1 ESF CSU, and one built-in synchronous data interface.

The network interface accommodates the 56/64kbps AT&T 62310 standard or the T1/FT1 D4/ESF framed standard, from one to twenty-four DS0s.

The synchronous user interface providesa V.35, EIA RS232C or EI RS530 connection that can be used for any synchronous application. The synchronous interface is software selectable. It will operate at 56/64 kbps or any multiple of 56 kbps or 64 kbps up to 1.536 Mbps. It will also operate at any current Frame Relay service data rates.

The Access Syst em56 addresses a variety of applications with the ability to provide 56/64 kbps DDS or T1/FT1 bandwidth for LANs, image transmission, mainframe file transfers and other high-speed applications.

Centum 56 Series Product

The Centum 56 Series product line includes the following specially featured unit types:

Access System 56 Plus (AS56 PLUS). A Centum 56 Series unit which can be converted from a 56/64 kbps DDS unit to a T1/FT1 unit. This can only be done by utilities configuration selection on the user's terminal screen (See Chapter 6, *Auxiliary Ports*).

Access System 56 (AS56). A Centum 56 Series unit which operates in56/64 kbps DDS Mode only.

T1 Concepts

A T1 digital transmission facility carries twenty-four 64 Kbps DS0 “channels,” for a total of 1.536 Mbps (plus 8K bps overhead to achieve the well-known 1.544 Mbps). These DS-0s can be demultiplexed by equipment such as Verilink’s Access Sys tem56 units, and groups of DS0s can be assigned to specific connectors on the equipment to transport computer information. In some cases, the user has access to the full 64 kbps per channel while, in other cases, the user is limited to 56 kbps per channel. A detailed explanation is provided in Chapter 3, *Configuring and Installing the Access Syst em56*.

The T1 facility itself can be a physical point-to-point circuit with all twenty-four DS0s going from one site to another. The facility can also be “Integrated Access,” that uses a Central Office DACS and one or more Fractional-T1 (F-T1) links. This is a physical multipoint facility with logical point-to-point links formed by groups of DS0s.

NMS (SNMP) Configuration, on page 6-29, describes examples of Access System 56 usage with both point-to-point and Integrated Access, Fractional T1 facilities.

Special Access Syste m56Features

Built-In 56/64 kbps DDS CSU

Interfacing to 56/64 kbps digital data system (DDS) service requires a DDS CSU (Channel Service Unit). The Access Syst em56 includes a built-in 56/64 kbps DDS CSU as standard equipment.

Built-In T1 ESF CSU

Interfacing to T1 or Fractional T1 services requires a T1 CSU. The Access Syst em56^{Plus} includes a built-in T1 ESF CSU as standard equipment. The superior ESF (Extended SuperFrame) CSU includes provisions for continuous performance monitoring by both the user and the telephone company central office. ESF provides a 4 Kbps link control channel (transparent to user data) which allows the telephone company to monitor the local loop, transmit and receive test messages and retrieve performance data, all without interrupting normal operations.

Network Protection

The Access Syst em56 provides complete electrical protection for the network by automatically inserting pulses into the transmitted signal as required to meet the bit density formula specified in AT&T Pub 62310 (56/64 kbps DDS) and in AT&T Pub 62411 (T1/FT1).

Front Panel Control

The Verilink Access Sys tem56 is easy to use. Configuration and testing are accomplished with a few buttons. Status is shown on a 32-character liquid crystal display (LCD) screen and seven front-panel indicators. The LCD screen serves as a "window" that can be moved vertically. The indicators are separated into Network and Serial Port (DTE) groups.

Terminal Control

All Access Syst em56 features can be accessed via an external terminal. The terminal's CRT allows displays that are much more comprehensive than possible via the front panel LCD. The user-supplied terminal can be selected from a wide variety of standard offerings or can be a PC with terminal emulation software.

NMS Control - SNMP Agent Inside

Configuration, dialing and testing can also be controlled through any SNMP Manager using the SNMP Agent software. The direct connection SLIP port on the rear panel of the Access Syste m56 supports speeds of 1200, 2400, 4800, and 9600 bps. A password routine prevents unauthorized access to the NMS console screens.

Printer Support

The Access Syst em56 includes a port for printer support. Real-time reports of all system events are automatically sent out this port. In addition, the front panel or an externally attached terminal can command printouts of configuration, alarms and ESF statistics.

Event Log

The Access Syst em56 constantly monitors for the occurrence of "events," such as alarms, test commands and system resets. When an

event occurs, a description with a time and date stamp is immediately sent out the printer port. In addition, the Access Sys tem56 maintains a log of the most recent sixteen events and that log can be accessed by either the front panel controls and LCD panel or an externally attached terminal.

Built-in Diagnostics

The Verilink Access Sys tem56 includes extensive capabilities to help pinpoint network problems without the need for external test equipment. Diagnostics include local and remote Serial Port digital loopbacks, LLB, RLB and payload NI loopbacks.

The Access Syst em56 also includes a built-in bit error rate tester (BERT), eliminating the need for external test equipment. The built-in tester transmits a 2047-bit pseudo random test pattern. The Access System 56 records errors received, seconds in test, and error-free seconds.

Alarm conditions are displayed on the front panel LCD screen as well as on the console's Alarms/Statistics screen. Front panel LEDs indicate unit and control signal status.

ESF Operation

The Access Syst em56 Extended SuperFrame (ESF) operation allows the telephone company central office to continuously monitor the local loop, to transmit and receive test messages, and to retrieve performance data, without interrupting normal operations. The units are compatible with both AT&T 54016 and ANSI T1.403 specifications.

Clear Channel

For T1/FT1 operation, the Access Syst em56 units provide clear channel signaling with B8ZS line coding (in installations where it is supported by the Telco central office) or alternate channel assignment.

Specifications

Product specifications for the Access S ystem56 are listed on the following page.

NETWORK INTERFACE

56/64 kbps DDS Mode

Interface	Integral 56/64 kbps DDS CSU
Format	Full 56/64 kbps DDS Compatibility per AT&T Tech Pubs 62310 *(Subrate speeds: 2400, 4800, 9600, 19200, 56000, and 64000)*
Line Rate	56/64 kbps Bipolar AMI, RTZ
Interface	Female, 8-position RJ-48C

T1/FT1 Mode

Interface	Integral ESF CSU
Framing	Full ESF/D4 Compatibility per AT&T Tech Pubs 62411, 54019, and ANSI T1.403
Line Rate	1.544 Mbps +/- 50 ppm, Bipolar AMI or B8ZS
LBO	0, 7.5, 15, 22.5 dB
Termination	Female, 8-position RJ-48C

TIMING

Clock Sources	Internal Frequency locked to Network (looptime) Frequency locked to Synchronous Serial Port

NETWORK DIAGNOSTICS

Local Loops	CSU, Line (LLB) and Payload loops
Remote Loops	Line (LLB), Payload and V54 Compliant loops
Test Patterns	2047 (DDS and T1 Modes) 1 of 8, 3 of 24, All Ones (T1 Mode Only)

SERIAL DATA INTERFACE

# of Ports	1 standard
Input Data Rates	56/64 kbps N x 56/64 Kbps for N= 1 to 24, up to 1.536 Mbps
Interfaces	Female 25-pin “D”. Software selectable V.35, RS-530, RS-232

LED INDICATORS

Network	Loop, Density, BPV, Alarm
Serial Port	Test, Loop, DC

PROGRAMMING

Front Panel	32 Character Liquid Crystal Display with front panel buttons SNMP Manager with integrated agent software ASCII Terminal Alarm Printer

MECHANICAL

Dimensions	8.35” W X 1.75” H X 10” D
Weight	7 pounds (maximum)
Mounting	Tabletop or Rack
Power	Integral supply, 90-230 Vac, 47-63 Hz
Environment	0 to 40 degrees C, 90% humidity (non-condensing)

Chapter

2

Front Panel Overview

Introduction

The front panel LCD screen displays two rows of sixteen characters each. Menu parameters are presented individually. The buttons to the right of the LCD screen scroll data vertically through the screen, displaying up to two parameters at a time. There are also seven LED indicators that are used to display the status of various Access Sys tem56 conditions.

Figure 2-1 Front Panel: Access System 56 Plus (AS56^{Plus}) T1 CSU/DSU

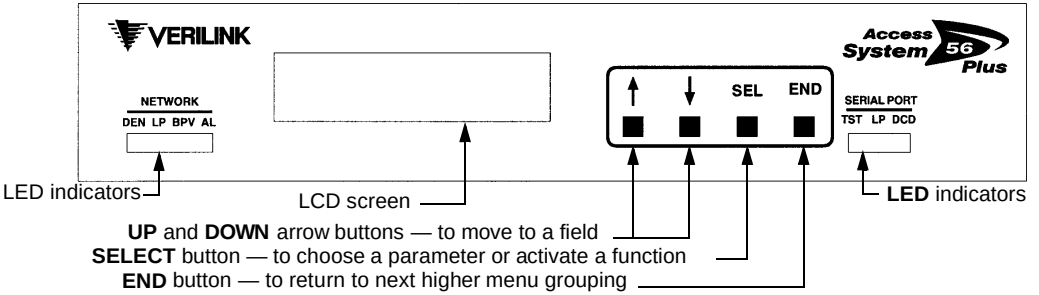
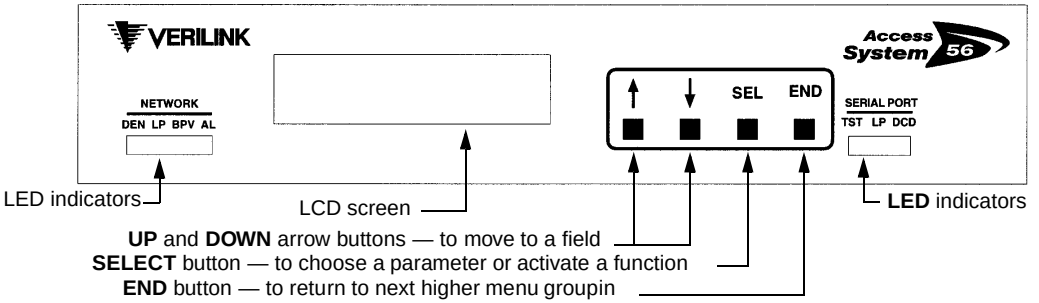


Figure 2-2 Front Panel: Access System 56 (AS56) CSU/DSU



There are an **UP** (↑) buttons, a **DOWN** (↓)button, a **SELECT** button, and an **END** button. The basic operating procedures are simple.

1. To select a menu, use the **UP** and **DOWN** buttons to move to the desired field.

2. Then, **SELECT** to choose the submenu.

3. To choose from a particular set of parameters or activate a function, use the **SELECT** key. Use **END** to return to the next higher menu grouping.

UP/DOWN (Arrow) Buttons. These buttons are used to move the display window vertically within a menu grouping. The **UP** button moves the display window up (backwards). The **DOWN** button moves the display window down (forward) to the next menu entry.

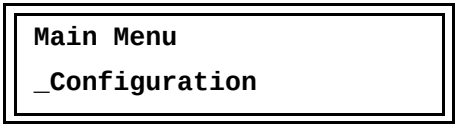
SELECT. Used to choose a submenu, choose a parameter activate a function.

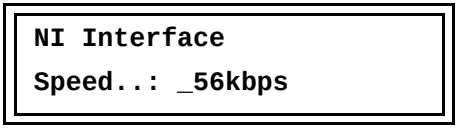
END. Used to return to the previous menu.

LCD Screen

The LCD screen is limited to two lines of 16 characters each.

The displayed menus include the **Main Menu**, which is sub-divided into the following five (5) menus: **Configuration**, **Diagnostics**, **Alarms & Statistics**, **Event Log**, and **Utilities**. Each sub-menu is further broken down into sub-level menus. Menu examples are shown below. Subsequent chapters give detailed information regarding these menus.





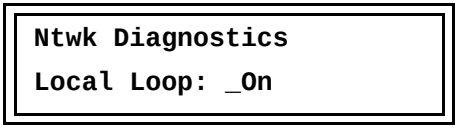
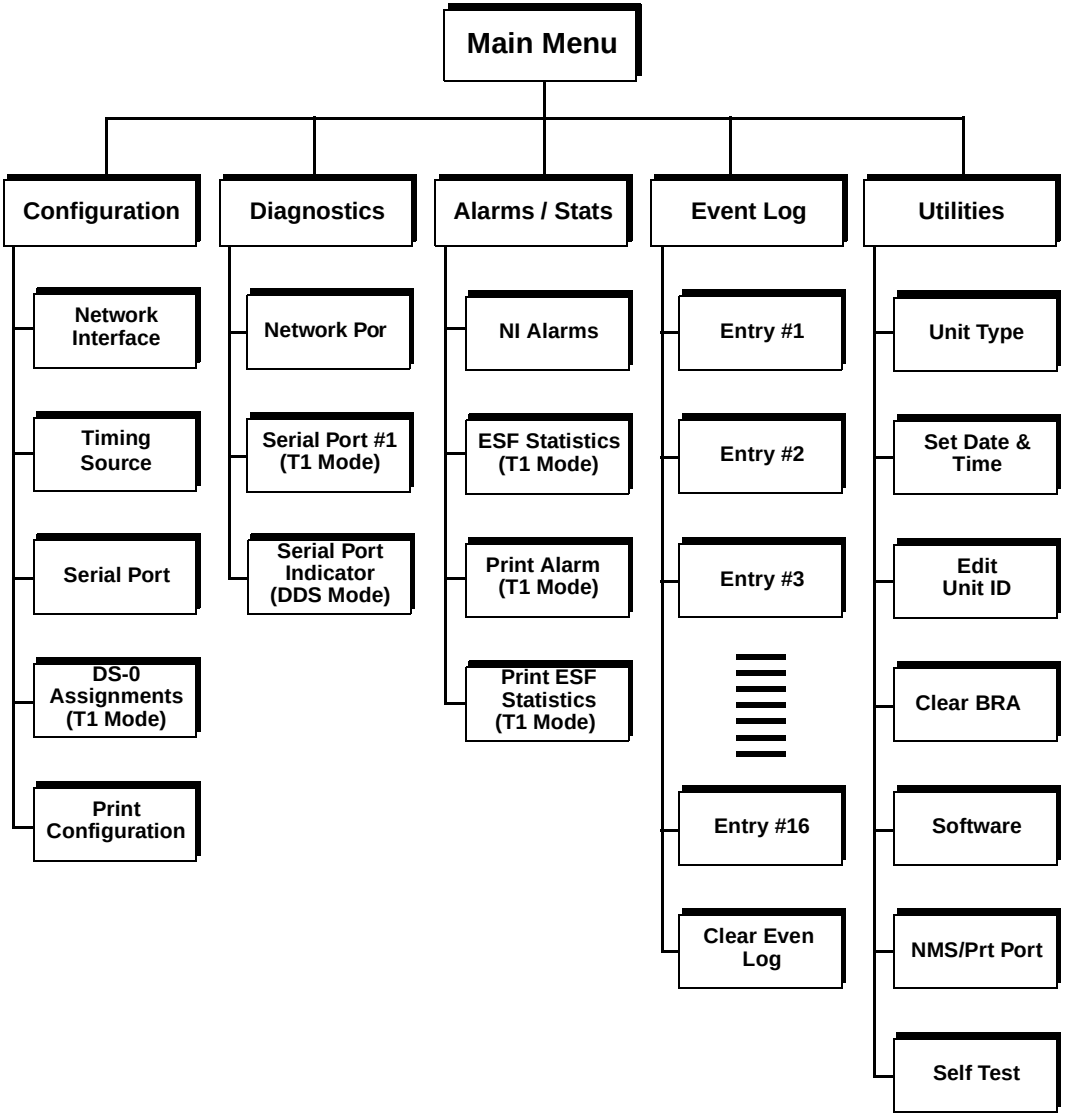


Figure 2-3 Centum 56 Series MenuTree



LED Indicators

There are seven LED indicators on the front panel. They are used to indicate the status of various alarm and call conditions. They monitor two areas of Access Syst em56 operation: Network Interface (NI) and Serial Port.

Network Interface

All Network LEDs should be OFF during normal operation.

LP. Illuminates when either the Network Interface is in a loopback state.

BPV. Illuminates when Bipolar Violations are being received from the Network. Can also indicated a very weak or overly strong signal.

AL. Illuminates when receive alarm condition (Red, Yellow, etc.) is detected on the network interface.

DEN. Used only in T1/FT1 mode. Indicates that the Network Interface is forcing the required number of transmitted "ones" to satisfy the T1 network requirements. This could be a result of improper configuration or failure of the customer's attached Serial Port equipment and **will** result in data corruption.

Serial Port

TST. Indicates the status of the BERT test if in progress. Will be **ON** only if the test results are good.

LP. Illuminates when a loop condition exists in the serial port either at the local or remote end.

DCD. Illuminates when the state of the Data Carrier Detect (or equivalent) lead being transmitted to the DTE connected to the serial port is **ON** or **HIGH**.

Chapter

3

Configuring and Installing the Access Syst em56

If you have purchased the AS56^{Plus} unit, you can select from two Network Interface Operating Modes:

- AS56 — factory default (56/64 kbps CSU/DSU)
- AS56^{Plus} — T1 CSU/DSU

Obviously, you must first insert the cable into the correct port. However, changing the operating mode can ***only*** be accomplished using the ASCII ***console*** interface. Before proceeding any further, refer to the procedures in *Terminal Configuration*, on page 6-5, and *Terminal Operation*, on page 6-7.

WARNING

The following rules should always be followed when connecting telephone equipment and/or wiring:

1. Never install telephone wiring during a lightning storm.
2. Never install the telephone jacks in wet locations unless the jack is specifically designed for wet locations.
3. Never touch insulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
4. Use caution when installing or modifying telephone lines.

NOTE

*Access Sys tem56 units should **not** be connected to the network until after it has been completely configured and has successfully passed self test.*

Requirements

Listed below are the requirements for operating Access Syste m56 units.

Software and hardware

Each Access Sys tem56 product is a self-contained unit that can be configured with no additional software or hardware.

This chapter describes the steps necessary to configure, test, and install Access Syst em56 using the front panel buttons and LCD panel. The same steps can be more easily performed using a customer-supplied external terminal (or PC with terminal emulation software). See Chapte r6, *AuxiliaryPorts*.

Power and environmental

Access Syst em56 uses 110-120 VAC, 60 Hz, at 0.25 amps.

Access Syst em56 does not require a conditioned environment but should be operated in areas with adequate ventilation.

Configuration Parameter

Proper configuration of the Access Syst em56 requires information regarding the network itself and the manner in which the network will be used. **Most of this information is readily available from the network supplier although some user decisions must be made from within the limitations of the network.**

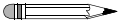
This manual includes a configuration worksheet at the end of this chapter to aid the user in configuring the unit. Verilink recommends that the master worksheet be photocopied and that copies be used to record the actual information for Access Sy stem56 units. By using the information in this chapter, one worksheet should be completed for each unit in the network. ***After*** completing ***all*** worksheets for ***all*** units, this chapter should again be used to actually configure the units.

Note that the Access Sys tem56 can remain unpowered indefinitely without losing the configuration parameters.

Plug in the Access Sy stem56 and confirm that the LCD panel displays:

```
Main Menu          HH:MM
_Configuration
```

If necessary, press the **UP** or **DOWN** arrow buttons until the panel displays the above information.



The item numbers in this section correlate to the circled reference numbers on the AS56 and AS56^{Plus} Worksheet, on page 3-30. To make your life easier, photocopy the worksheet and complete it as a record of each unit's configuration.

1. **Model number** Administration information indicating specific Access Syst em56 model being configured.

2. **Company name and location.** Administrative information determined by customer.

3. **DDS Carrieror T-Carrier ID, Local Circuit ID, and Billing Number** Administrative information obtained from the network supplier.

NOTE

Steps 4 through 11 (below) apply to T1/FT1 network interface configuration while Steps 12 through 15 apply to 56/64 kbps DDS network interface configuration.

SELECT *to display:*

```
Configuration
_NI Interface
```

SELECT *to display:*

```
NI Configuration
Framing:_XX
```

4. **NI Framing.** This information must be obtained from the network supplier. Depress **SELECT** to choose between **D4** and **ESF**.

DOWN *to display:*

```
NI Configuration
Line Code:_XXX
```

5. **NI Line Code.** This information must be obtained from the network supplier. Depress **SELECT** to choose between **AMI** and **B8ZS**.

DOWN *to display:*

```
NI Configuration
LBO..:_X dB
```

6. **NI LBO (Line Build Out).** Should be set to **0 dB** unless the network supplier specifically requests otherwise. If requested, repeatedly **SELECT** to choose **0**, **7.5**, **15**, or **22 dB**.

DOWN *to display:*

```
NI Configuration
NTWK Diag.: XXX
```

7. **Network Diagnostics.** This entry determines the Access Sy stem56's ability to respond to diagnostic commands received from the network supplier. Repeatedly **SELECT** to choose between **Yes** and **No**.

   User equipment must always respond to network-generated diagnostic commands. Select **Yes** unless the commands are to be passed to another T1 device that will respond.

DOWN *to display:*

```
NI Configuration
Density: XXXX
```

8. **NI Density.** This information must be obtained from the network supplier. Depress **SELECT** to choose **Clear** or **62411**. A **Clear** network imposes no "ones density" requirements on the user. A **62411** network complies with AT&T Technical Reference #62411 and limits Access Sy stem56 transmission to no more than fifteen consecutive zeroes.

   If the Line Code entry is **B8ZS**, choose **Clear**. If the Line Code entry is **AMI**, choose **62411**.

DOWN *to display:*

```
NI Configuration
NI CFA:_XXX
```

9. **NI CFA.** Depress **SELECT** to choose between **Yes** and **No**.

   Yes causes the unit to discard data and send a "yellow alarm" if it is in a "red alarm" condition for three seconds.

Yes should be chosen if the network supplier is a common carrier, such as a telephone company, and the application is ***data and voice***. **No** may be selected for ***data only*** applications. If the network is private, the selection is a user option.

DOWN *to display:*

```
NI Configuration
ESF Frmt:_XXX
```

10. **ESF Reporting Format.** This entry describes the types of ESF network commands that the unit will respond to. It has no meaning for D4 networks: see Framing (item #4, above). With ESF networks, this information must be obtained from the network supplier.

    Depress **SELECT** to choose between AT&T Technical Reference **54016** and ANSI specification **T1.403**.

DOWN *to display:*

```
NI Configuration
Clear Regs:_XXX
```

11. **Clear Registers.** Depress **SELECT** to choose between **Yes** and **No**. **Yes** is the recommended choice.

    When commanded by the network supplier, the unit will transmit stored error information to the supplier.

    A **Yes** entry will cause the unit to clear all error counts when it is powered down and back up again.

    A **No** entry will allow potentially invalid information to be retained in the error registers in preparation for transmission to the network supplier.

NOTE

Steps 12 through 15 apply to 56/64 kbps DDS network interface configuration.

UP/DOWN *to display:*

```
Configuration
_NI Interface
```

SELECT *to display:*

```
NI Configuration
SPEED..:_56kbps
```

12. **Network Speed.** This information must be obtained from the network supplier. Depress **SELECT** to choose between **56kbps** and **64kbps**.

DOWN *to display:*

```
NI Configuration
NTWK Diag.:Yes
```

13. **Network Diagnostics.** This entry determines the unit's ability to respond to diagnostic commands received from the network supplier. Depress **SELECT** to choose between **Yes** and **No**.

    User equipment must always respond to network-generated diagnostic commands. Select **Yes** unless the commands are to be passed to another DDS device that will respond.

DOWN *to display:*

```
NI Configuration
Scrambler:_No
```

14. **Network Scrambler.** This entry enables the unit to avoid inadvertent transmission of network loopback latching codes. The scrambler option is only needed in 64 kbps mode, and if enabled, must be enabled on both the local Access Syste m56 and the remote Access System 56 units. Depress **SELECT** to choose between **Yes** and **No**.

DOWN *to display:*

```
NI Configuration
DTE LOS:_RTS
```

15. **Network DTE LOS (Loss of Signal).** This entry determines which control signal forces the unit into a LOS state. When a LOS state occurs, the Access Sys tem56 unit will continuously transmit the Control Mode Idle (CMI) code to the network. Depress **SELECT** to choose between **RTS**, **DTR** and **None**.

NOTE

Step 16 applies to both the T1 and DDS modes.

END *to display:*

```
Configuration
_NI Interface
```

DOWN *to display:*

```
Configuration
_Timing Source
```

SELECT *to display:*

```
Timing Source
Source:_Int
```

16. **Timing Source.** Depress **SELECT** to choose **NI**, **Port 1**, or **Int**.

    As a 56/64 kbps CSU/DSU, ALL units **must** use **NI** timing.

In a point-to-point configuration, ***one*** unit **must** use **NI** timing and the other unit **must** use something else. This "something else" is nearly always **Int** (Internal), but some user configurations require **Port 1** timing. Contact the Technical Assistance Center if assistance is needed.

NOTE

Steps 17 through 25 (below) apply to Serial Port #1 in T1/FT1 mode.

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Configuration
```

SELECT *and* **UP/DOWN** *to display:*

```
Configuration
_Serial Port
```

SELECT *to display:*

```
Serial Port
_XXXK (X DS0)
```

17. **Serial Port Data Rate.**

NOTE

In an Integrated Access, Fractional T1 environment, this selection ***MUST*** *be coordinated with the network supplier.*

Before entering a value, the user must first determine if each DS0 will carry 56 kbps or 64 kbps user data and must then determine the correct quantity of DS0s necessary to achieve the desired data rate.

See **Density** (item #8, above). If the NI is **Clear**, the 56/64 decision is completely user optional and **64Kbps** is recommended to obtain maximum data transfer efficiency in the network.

If the NI is ***not*** **Clear**, steps must be taken to ensure the proper "ones density" in the data presented to the network. If this is not done, the unit may occasionally damage user data in order to satisfy network

requirements. There are three methods that can be used to ensure ones density in the data:

- Limit the user data to 56 kbps per DS0. Access Sy stem56 will use the remaining 8 kbps (in each DS0) to provide the required density.
- Allow 64 kbps user data in each DS0 and use alternate DS0s. Keep the intervening DS0s idle to provide the density. See **Alt/Consec** below (item #19). This method wastes significant bandwidth and should only be used when absolutely necessary.
- Allow 64 kbps user data in each DS0 when the user's protocol provides the required density. See **Data Norm/Inv** below (ite m#20).

When the 56/64 decision has been made, repeatedly **SELECT** until the desired data rate is displayed on the left side of the LCD panel AND the correct DS0 quantity is displayed on the right side. Select **N/U** if the Serial Port will not be used.

CAUTION

In some cases, the same data rate can be achieved with two different DS0 quantities, one with 56 kbps DS0s and the other with 64 kbps DS0s.

DOWN *to display:*

```
Serial Port
First DS0:_01
```

18. **Serial Port, DS0 assignments.** This selection determines which specific DS0s within the T1 stream will support the Serial Port.

*In an Integrated Access, Fractional T1 environment, this selection **MUST** be coordinated with the network supplier.*

The **First DS0** is the lowest numbered DS0 of the quantity indicated in **Data Rate** (items #13 and #20, above). Depress **SELECT** until the desired **First DS0** appears in the display. The remaining DS0s required to support the desired data rate are the next higher numbered

contiguous or alternate DS0s. It is not possible for the string of DS0s to "wrap" from DSO-24 to DSO-1.

DOWN *to display:*

```
Serial Port
_Consec. DS0s
```

19. Depress **SELECT** to choose either **Consecutive** or **Alternate**. If **Consec. DS0s** is chosen, the DS0s assigned to this serial port will be a contiguous string beginning with the **First DS0**.

    If **Alternate DS0s** is chosen, the unit will insert an idle DS0 immediately after each one required for user data. For example, if the first DS0 is #1 and four alternate DS0s are selected, #1, #3, #5, and #7 will carry user data while #2, #4, #6, and #8 will be idle.

    When this selection is made, place checkmarks in the appropriate "T-Channel Definitions" boxes to simplify recordkeeping. Don't forget to account for 56 kbps vs. 64 kbps DS0s.

DOWN *to display:*

```
Serial Port
Type:_V.35
```

20. **Serial Port, Interface Type.** This enables the user to select the serial cable interface type to be used with the Access S ystem56. Depress **SELECT** to choose between **V.35**, **RS530/422** and **RS232**.

DOWN *to display:*

```
Serial Port
CD.:_On
```

21. **Serial Port, CD handling.** The Access Syst em56 presents a DCE interface to the attached customer equipment. Carrier Detect (CD) can be

    - permanently On

- permanently Off
- CD tracks RT
- Switched (normally **On**, turns **Off** upon network carrier failure).

Switched is the recommended mode of operation unless the customer DTE requires otherwise. Depress **SELECT** to choose **On**, **Off**, **CD tracks RT**, or **Switched**.

DOWN *to display:*

```
Serial Port
Data..: XXX
```

22. **Serial Port, data normal/inverted.**

Depress **SELECT** to choose between **Norm** and **Inv**.

- If Density is Clear, choose **Norm**.
- If Data Rate uses 56 kbps per DS0, choose **Norm**.
- If Alt/Consec is Alternate, choose **Norm**.

If none of the above conditions apply, consider the following:

Some user protocols, such as SDLC and HDLC, have a “zeroes density” characteristic that, when inverted, results in the required T1 “ones density”. If the attached DTE uses one of these protocols AN also inverts the data, choose **Norm** and confirm that the mated serial port (at the “other end” of the circuit) is configured the same.

If the attached DTE uses one of these protocols and does NOT invert the data, choose **Inv** and confirm that the mated serial port (at the “other end” of the circuit) is configured the same.

NO OTHER CONDITIONS AREVALID. Please refer to discussion under “Serial Port Data Rate”.

DOWN *to display:*

```
Serial Port
Clock.:_Norm
```

23. **Serial Port, clock normal/inverted.**

Depress **SELECT** to choose **Norm** or **Inv**. Initially choose **Norm**. If frequent errors occur at this serial port, try **Inv** and check performance.

Normally, the down-going clock edge is in the middle of each bit. This is required by networks. Some DTEs, particularly with high-speedV.35 configurations and/or lengthy cables, place the rising edge in the middle of each bit. **Inv** will correct this condition to satisfy the network.

DOWN *to display:*

24. **Serial Port clock handling.**

Depress **SELECT** to choose **Internal**, **External,** or **Int/Ext**.

Internal is the normal setting and should always be chosen unless there is specific reason to do otherwise. At the serial interface, Access Syst em56 will provide both TX-clock and RX-clock to the customer DTE.

External should be used with the Serial Port if the attached user equipment is DCE, rather than DTE. With external timing, the user's DCE must be used as the system's master clock. See Timing Source (item #16, above). The "external clock" is the "External Timing" pin on the interface.

The **External** setting requires special user cabling and a very specific configuration for the user DCE. Please refer to Appendix "C" for more information.

Int/Ext is recommended if the attached user DTE cable exceeds ten feet in length and the customer data rate exceeds 224 kbps.

The **Int/Ext** setting may require a special DTE configuration or a modified cable. Please refer to Appendi xA, *Standard Cabling for User Ports* for more information.

DOWN *to display:*

```
Serial Port
Rem Loop:_Yes
```

25. **Serial Port Remote Loop Enable/Disable.**

Depress **SELECT** to choose between **Yes** (Enabled) and **No** (Disabled).

When **Enabled**, this Serial Port channel ***will*** respond to receipt of a remote digital loop command arriving from the Serial Port channel of the mated Access Syst em56 unit. **Enabled** is recommended unless the user has specific reason to do otherwise.

When **Disabled**, this Serial Port channel will ***not*** respond to receipt of a remote digital loop command.

END *to display:*

```
Configuration
__Serial Port
```

END *to display:*

```
Main Menu          HH:MM
__Configuration
```

NOTE

Steps 26 through 31 (below) apply to Serial Port #1 in 56/64 kbps DDS mode.

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Configuration
```

SELECT *and* **UP/DOWN** *to display:*

```
Configuration
__Serial Port
```

SELECT *to display:*

```
Serial Port
Type:_V.35
```

26. **Serial Port, Interface Type.** This enables the user to select the serial cable interface type to be used with the Access S ystem56. Depress **SELECT** to choose between **V.35**, **RS530/422** and **RS232**.

DOWN *to display:*

```
Serial Port
CD.:_On
```

27. **Serial Port, CD handling.** The Access Syst em56 presents a DCE interface to the attached customer equipment. Carrier Detect (CD) can be

    - permanently On
    - permanently Off
    - CD tracks RT
    - Switched (normally **On**, turns **Off** upon network carrier failure).

Switched is the recommended mode of operation unless the customer DTE requires otherwise. Depress **SELECT** to choose **On**, **Off**, **CD tracks RT**, or **Switched**.

DOWN *to display:*

```
Serial Port
Data.:_Norm
```

28. **Serial Port, data normal/inverted.**

    Depress **SELECT** to choose between **Norm** and **Inv**.

DOWN *to display:*

```
Serial Port
Clock.:_Norm
```

29. **Serial Port, clock normal/inverted.**

    Depress **SELECT** to choose **Norm** or **Inv**. Initially choose **Norm**. If frequent errors occur at this serial port, try **Inv** and check performance.

    Normally, the down-going clock edge is in the middle of each bit. This is required by networks. Some DTEs, particularly with high-speedV.35 configurations and/or lengthy cables, place the rising edge in the middle of each bit. **Inv** will correct this condition to satisfy the network.

DOWN *to display:*

```
Serial Port
Clocks:_Internal
```

30. **Serial Port clock handling.**

    Depress **SELECT** to choose **Internal**, **External,** or **Int/Ext**.

    Internal is the normal setting and should always be chosen unless there is specific reason to do otherwise. At the serial interface,

Access Syst em56 will provide both TX-clock and RX-clock to the customer DTE.

External should be used with the Serial Port if the attached user equipment is DCE, rather than DTE. With external timing, the user's DCE must be used as the system's master clock. See Timing Source (item #16, above). The "external clock" is the "External Timing" pin on the interface.

The **External** setting requires special user cabling and a very specific configuration for the user DCE. Please refer to Appendi xC, *Special Serial Port Cabling* for more information.

The **Int/Ext** setting may require a special DTE configuration or a modified cable. Please refer to Appendi xC, *Special Serial Port Cabling* for more information.

DOWN *to display:*

```
Serial Port
Rem Loop:_Yes
```

31. **Serial Port Remote Loop Enable/Disable.**

Depress **SELECT** to choose between **Yes** (Enabled) and **No** (Disabled).

When **Enabled**, this Serial Port channel ***will*** respond to receipt of a remote digital loop command arriving from the Serial Port channel of the mated Access Syst em56 unit. **Enabled** is recommended unless the user has specific reason to do otherwise.

When **Disabled**, this Serial Port channel will ***not*** respond to receipt of a remote digital loop command.

END *to display:*

```
Configuration
__Serial Port
```

END *to display:*

```
Main Menu          HH:MM
__Configuration
```

Checking the "T-Channels"

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Configuration
```

SELECT *to display:*

```
Configuration
_Ntwk Interface
```

DOWN *as required to display:*

```
Configuration
_DS0 Assignments
```

SELECT *to display:*

```
Channel            Mode
_01:               Idle
```

Depress **UP** or **DOWN** while comparing Access Syst em56 display with the checkmarks in the worksheet T-Channel Definitions.

Note that "Idle**"** refers to channels that have been configured as "Not Used" in the unit.

The DS0 configuration can also be sent to a printer. Please refer to Chapter 6, *Auxiliary Ports*.

END *to display:*

```
Configuration
__DS0 Assignments
```

END *to display:*

```
Main Menu          HH:MM
__Configuration
```

Access Sy stem56 Self-Testing

The self-testing can be performed via either the Acces s System56 control panel or an external terminal or PC. The instructions below assume that the unit's control panel is being used. Chapte r6, *Auxiliary Ports*, describes usage of an external terminal.

T1/FT1 mode self-testing

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Diagnostics
```

SELECT *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *to display:*

```
NI Diagnostics
Local Loop..:_Off
```

If the **Local Loop** is presently **Off**, the Network **ALARM** indicator should be illuminated. If the Local Loop is presently **On**, the Network **ALARM** indicator should be extinguished. Depress **SELECT** to turn the loop **On** and **Off** while confirming proper functioning of the Network **ALARM** indicator. Leave the Local loop in the **On** condition.

DOWN *to display:*

```
NI Diagnostics
BERT......:_Off
```

If necessary, **SELECT** *to display:*

```
NI Diagnostics
BERT......:_On
```

DOWN *and* **SELECT** *to display:*

```
NI Diagnostics
Err Secs.:_00000
```

DOWN *as required and* **SELECT** *to display:*

```
NI Diagnostics
Sec/Test.:_00000
```

Confirm that the **Seconds/Test** is properly incrementing and then depress **UP** to confirm that the Errored Seconds is not incrementing. If the unit is receiving errored seconds, confirm your configuration and run the self-testing again. If the unit still indicates “errored seconds”, contact our Technical Assistance Center.

Turn **Off** the BERT and the Local Loop.

Cycle through the **Diagnostics** menus and confirm that all test functions (loops and BERT) are **Off**. (If necessary, turn them **Off**).

If the unit is being used in a point-to-point configuration, configure and self-test the remote unit. If the unit is being used in an Integrated Access, Fractional T1 environment, configure and self-test all remaining units.

56/64 kbps mode self testing

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Diagnostics
```

SELECT *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *to display:*

```
Ntwk Diagnostics
Local Loop..:_Off
```

If the **Local Loop** is presently **Off**, the Network **ALARM** indicator should be illuminated. If the Local Loop is presently **On**, the Network **ALARM** indicator should be extinguished. Depress **SELECT** to turn the loop **On** and **Off** while confirming proper functioning of the Network **ALARM** indicator. Leave the Local loop in the **On** condition.

DOWN *as required to display:*

```
Ntwk Diagnostics
DSU Loop..:_Off
```

If necessary, **SELECT** *to display:*

```
Ntwk Diagnostics
DSU Loop..:_On
```

DOWN *as required to display:*

```
Ntwk Diagnostics
BERT.....:_Off
```

If necessary, **SELECT** *to display:*

```
Ntwk Diagnostics
BERT......:_2047 or
            All 0s
```

DOWN *and* **SELECT** *to display:*

```
Ntwk Diagnostics
Loc ES...:_00000
```

DOWN *as required and* **SELECT** *to display:*

```
Ntwk Diagnostics
Sec/Test.:_00000
```

Confirm that the **Seconds/Test** is properly incrementing and then depress **UP** to confirm that the Errored Seconds is not incrementing. If the unit is receiving errored seconds, confirm your configuration and run the self-testing again. If the unit still indicates “errored seconds”, contact our Technical Assistance Center.

Turn **Off** the BERT and the Local Loop.

Cycle through the **Diagnostics** menus and confirm that all test functions (loops and BERT) are **Off**. (If necessary, turn them **Off**).

If the unit is being used in a point-to-point configuration, configure and self-test the remote unit. If the unit is being used in an Integrated Access T1 environment, configure and self-test all remaining units.

Connecting the Access S ystem56

After all units have been configured and self-tested, they should be connected to the network via the 8-pin modular jack (RJ-48 configuration).

The User DTEs should also be connected at this time.

- RS-530 DTEs connect to the DSUs via male DB-25 connectors.
- V.35 DTEs and RS-449 (37-pin) DTEs connect to the DSUs via mechanical adapters (supplied byVerilink).

All cable specifications are given in Appen dixA, *Standard Cabling for User Ports*.

Line Testing

This section discusses line testing for point-to-point configuration and Fractional T1 Integrated Access.

Point-to-Point Configuration

The line testing can also be performed via either the Acces s System56 control panel or an external terminal or PC. The instructions belo assume that the unit is using the front control panel. Chapter 6, *Auxiliary Ports*, describes usage of an external terminal.

Confirm that both ends are configured, self-tested, and connected to the network. Confirm that the **ALARM** indicator is extinguished at both ends. If not, review both configurations and repeat both self-tests. If either **ALARM** indicator remains illuminated, contact ourTechnical Assistance Center. Once the **ALARM** indicators are extinguished, proceed as follows.

T1/FT1 Mode Line Testing

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Diagnostics
```

SELECT *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *to display:*

```
NI Diagnostics
Local Loop..:_Off
```

DOWN *as required to display:*

```
NI Diagnostics
NI RLB..:_Off
```

SELECT *to display:*

```
NI Diagnostics
NI RLB..:_On
```

If the remote end responds properly to this command, the Network **LOOP** indicator will illuminate within approximately ten seconds. If the remote end does not respond properly, the **LOOP** indicator will remain extinguished and the LCD panel will change to **NI RLB..:_Off**.

Confirm that the remote end has responded properly. If it has not, check the Network cable connections and try again. If it still does not respond, contact your network supplier. Continue with the following steps only if the remote end has responded properly.

DOWN *as required and* **SELECT** *to display:*

```
NI Diagnostics
BERT......:_On
```

DOWN *as required and* **SELECT** *to display:*

```
NI Diagnostics
Err Secs.:_00000
```

DOWN *as required and* **SELECT** *to display:*

```
NI Diagnostics
Sec/Test.:_00000
```

Confirm that the **Seconds/Test** is properly incrementing and then depress **UP** to confirm that the **Errored Seconds** is ***not*** incrementing. If the unit is receiving errored seconds, confirm your configuration and run the testing again. If the unit still indicates errored seconds, contact our Technical Assistance Center.

Turn **Off** the BERT and the Loop. Your system is now ready for operation.

56/64 kbps DDS Mode Line Testing

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Diagnostics
```

SELECT *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *to display:*

```
Ntwk Diagnostics
Local Loop..:_Off
```

DOWN *as required to display:*

```
Ntwk Diagnostics
Remote Loop:_Off
```

SELECT *to display:*

```
Ntwk Diagnostics
Remote Loop:_On
```

If the remote end responds properly to this command, the Network **LOOP** indicator will illuminate within approximately ten seconds. If the remote end does not respond properly, the **LOOP** indicator will remain extinguished and the LCD panel will change to **Remote Loop:_Off**.

Confirm that the remote end has responded properly. If it has not, check the Network cable connections and try again. If it still does not respond,

contact your network supplier. Continue with the following steps only if the remote end has responded properly.

DOWN *as required and* **SELECT** *to display:*

```
Ntwk Diagnostics
DSU Loop:_On
```

UP *as required and* **SELECT** *to display:*

```
Ntwk Diagnostics
BERT......:_2047 or
            All 0s
```

DOWN *as required and* **SELECT** *to display:*

```
Ntwk Diagnostics
Local ES:_00000
```

DOWN *as required and* **SELECT** *to display:*

```
Ntwk Diagnostics
Sec/Test.:_00000
```

Confirm that the **Seconds/Test** is properly incrementing and then depress **UP** to confirm that the **Errored Seconds** is ***not*** incrementing. If the unit is receiving errored seconds, confirm your configuration and run the testing again. If the unit still indicates errored seconds, contact our Technical Assistance Center.

Turn **Off** the BERT and the Loops. Your system is now ready for operation.

Line Testing (Integrated Access, Fractional T1)

The line testing can be performed via either Acce ss System56 control panel or an external terminal or PC. The instructions below assume that the unit's control panel is being used. Chapte r6, *Auxiliary Ports*, describes usage of an external terminal.

The line itself cannot be tested directly in an Integrated Access, Fractional T1 environment (the Network remote loop will not function). It can, however, be tested indirectly by using the Serial Port channel. If a Serial Port channel is being used, Remote Loop must be enabled for all Access Syst em56 units at remote locations.

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Diagnostics
```

Use **SELECT** and the **UP** and **DOWN** arrows to choose Serial Port.

Use **SELECT** and the **UP** and **DOWN** arrows to choose Remote Loop **On** or Local Loop **On** (but ***not*** both). Then, use the **UP/DOWN** arrows and **SELECT** to turn on the BERT. Finally, use the arrows to confirm that Seconds/Test is incrementing but Local and Remote Errored Seconds is not incrementing. This checks out the link from the local site to the ultimate Serial Port destination.

Turn **Off** the BERT and the Loop. Your system is now ready for operation.

AS56 and AS56^{Plus} Worksheet

Model # _____ (1)

Company Name: _____ (2)

Location: _____ (2)

T-Carrier ID: _____ (3)

Local Circuit ID: _____ (3)

Billing Number: _____ (3)

56/64 kbps DDS Carrier ID: _____ (3)

Local Circuit ID: _____ (3)

Billing Number: _____ (3)

T1 Network Interface

Framing: _____ (4)

Line Code: _____ (5)

Line Build Out: _____ (6)

NTWK Diag.: _____ (7)

Density: _____ (8)

NI CFA: _____ (9)

ESF Format: _____ (10)

Clear Registers: _____ (11)

Timing Source

Source: _____ (16)

Serial Port

Data Rate: _____ (17)

First DS-0: _____ (18)

Alt/Consecutive: _____ (19)

Interface Type: _____ (20) & (26)

CD Handling: _____ (21) & (27)

Data Norm/Inv: _____ (22) & (28)

Clock Norm/Inv: _____ (23) & (29)

Clocks: _____ (24) & (30)

Remote Loop: _____ (25) & (31)

56/64 kbps Network Interface

Speed: _____ (12)

Network Diagnostics: _____ (13)

Scrambler: _____ (14)

DTE LOS: _____ (15)

T-Channel Definitions

T-Channel Number	Serial Port (18)	Not Used	T-Channel Number	Serial Port (18)	Not Used
DS0-1			DS0-13		
DS0-2			DS0-14		
DS0-3			DS0-15		
DS0-4			DS0-16		
DS0-5			DS0-17		
DS0-6			DS0-18		
DS0-7			DS0-19		
DS0-8			DS0-20		
DS0-9			DS0-21		
DS0-10			DS0-22		
DS0-11			DS0-23		
DS0-12			DS0-24		

Chapter

4

Testing the Access Syst em56

Access Syst em56 testing can be performed via either the unit's control panel or an external terminal or PC. The instructions below assume that the unit's control panel is being used. Chapter 6, *Auxiliary Ports*, describes usage of an external terminal.

The Access Syst em56 includes extensive diagnostic capabilities that allow testing of the unit itself as well as the attached network. Follow the instructions below to access the Diagnostic Menus for Access Sys tem56 testing:

From Main Menu, **UP/DOWN** *to display:*

```
Main Menu          HH:MM
_Diagnostics
```

Testing in T1/FT1 Mode

This section discusses the various tests available for the AS56^{Plus}, operating in T1/FT1 mode.

Local Loop

When the **Local Loop** is **ON**, the front panel **LP** LED will illuminate and local testing can be performed by external DTE equipment or by Access System 56's internal BERT

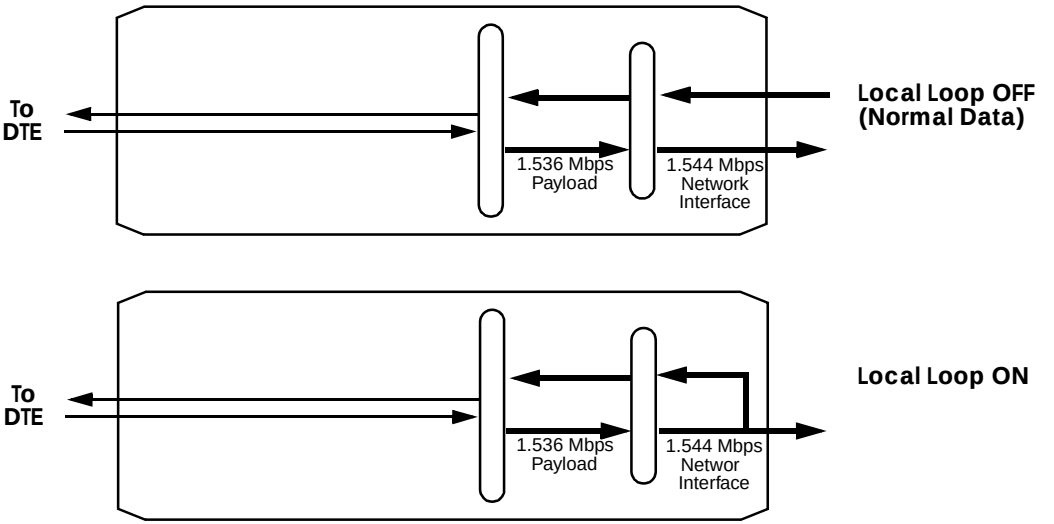
From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *then* **DOWN** *to display:*

```
NI Diagnostics
_Local Loop..:_Off
```

SELECT as required to turn the Local loop off or on.



Payload BERT

The Payload BERT is useful in a point-to-point environment. The Access System 56 units at both ends of the circuit must be placed in a Payload BERT condition with the same BER pattern.

From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

SELEC *, then* **DOWN** *to display:*

```
NI Diagnostics
Tst Pat._XXX
```

SELECT as required to choose the desired Bit Error Rate pattern of **2047**, **1 of 8**, **3 of 24**, or **All Ones**.

DOWN *and* **SELECT** *as required to display:*

```
NI Diagnostics
BERT......:_On
```

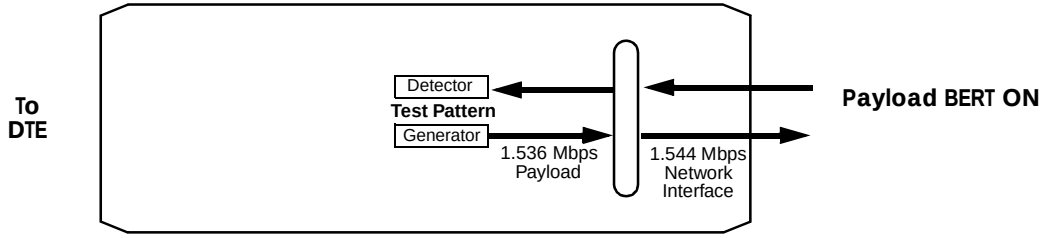
If the BER pattern was changed in the previous step, the BERT must be turned **OFF** and back **ON** again to establish the new pattern. **SELECT** as required to turn the BERT Off/On.

DOWN *and* **SELECT** *as required to display:*

```
NI Diagnostics
Sec/Test.:_00000
```

If the CSU portions of the Access Syste m56 units and the data link are all functioning properly, the **Seconds/Test** at both units will increment while the **Errored Seconds** at both units will not increment.

WHEN TESTING IS COMPLETED, BE SURE TO TURN BOTH BERT TESTS "OFF".

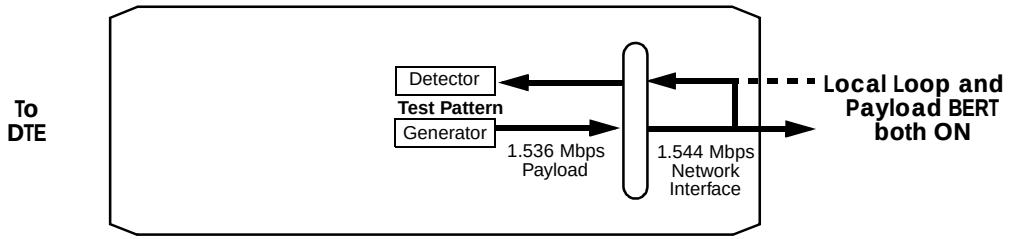


Local Loop with BERT

The CSU portion of a single Access Sys tem56 unit can be tested by activating both the Local Loop and the Payload BERT. Refer to page 4-2 and page 4-3.

If the CSU portion of the unit is functioning properly, the **Seconds/Test** will increment while the **Errored Seconds** will not increment.

WHEN TESTING IS COMPLETED, BE SURE TO TURN BOTH THE LOOP AND THE BERT "OFF".



Payload Loop

The Payload Loop is useful for looping back any testing initiated by the other end of a point-to-point circuit, such as Payload BERT, Serial BERT, or any externally generated testing.

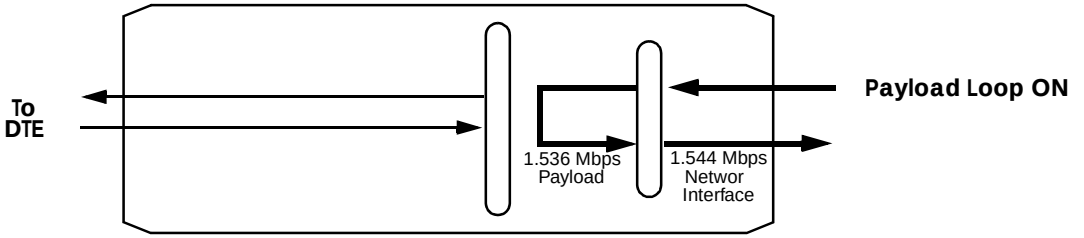
WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP "OFF".

From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *and* **DOWN** *as required to display:*

```
NI Diagnostics
PAYLD Loop:_On
```



SELECT as required to turn the Payload Loop Off/On.

Line Loop

LLB causes a local line loop (at the Acce ss System56 unit where the command was entered). RLB causes a remote line loop (at the distant end of a point-to-point circuit); RLB should ***not*** be attempted in an Integrated Access, Fractional T1 environment.

The CSU is excluded from the test path in a Line Loop configuration.

In a point-to-point circuit, the LLB and RLB are useful for looping back any testing initiated by the other end, such as Payload BERT, Serial Port BERT, or any externally generated testing.

In an Integrated Access, Fractional T1 circuit, LLB is useful for looping back Serial Port testing initiated by any remote location.

WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP "OFF".

From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

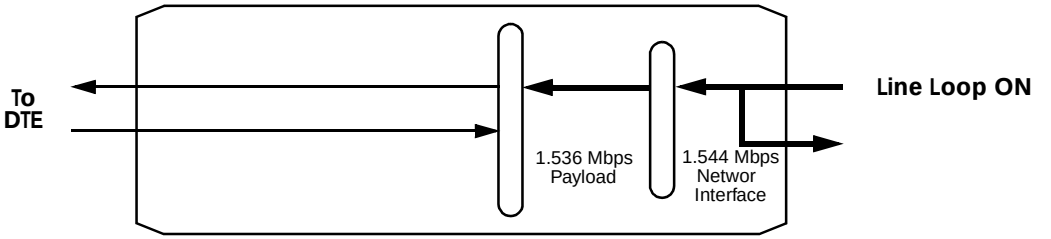
SELEC *, then* **DOWN** *as required to display:*

```
NI Diagnostics
NI LLB...:_On
```

OR

```
NI Diagnostics
NI RLB...:_On
```

SELECT as required to turn the loop Off/On.



Serial Port Loop

Local Loop ON causes a loop (at the Access Sy stem56 unit where the command was entered). Remote Loop ON causes a loop at the Serial Port at the distant end. In an Integrated Access, Fractional T1 environment, the Serial Port link through the network is a logical point-to-point connection and the "distant end" is the destination for the serial port data.

CAUTION

Local and Remote Loops should not be activated at the same time unless the serial port BERT is also activated at the local end.

WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP "OFF".

From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Serial Port #1
```

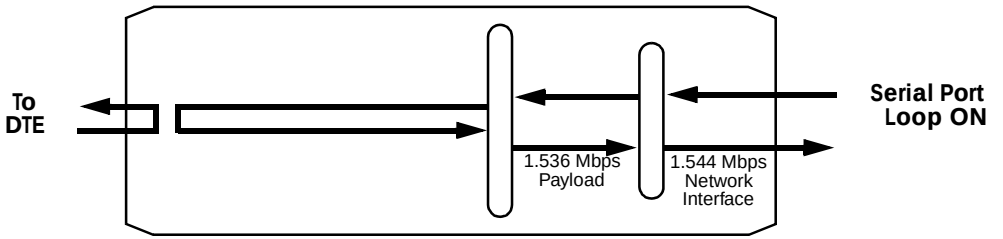
SELECT *to display:*

```
SP Diagnostics
_Local Loop: On
```

OR

SELEC *, then* **DOWN** *and* **SELECT** *as required to display:*

```
SP Diagnostics
_Remote Loop: On
```



Serial Port BERT

The Serial Port (DTE) BERT can be used as a part of many different test configurations. It is most valuable with both the Local and Remote Serial Port Loops activated. The local end of the recommended configuration is shown below.

The "Local" Errored Seconds are counted by the detector toward the left side in the figure. The "Remote" Errored Seconds are counted by the detector toward the right side.

WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP AND BERT "OFF".

From Diag. Menu, **UP/DOWN** *to display:*

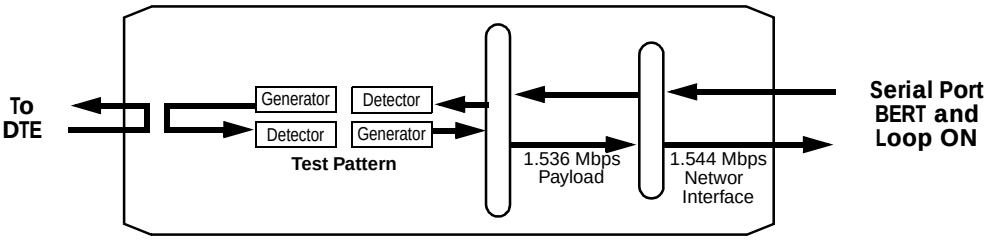
```
Diagnostics
_Serial Port
```

SELECT *to display:*

```
SP Diagnostics
Local Loop.: Off
```

Use **SELECT** and **UP/DOWN** as required to:

- Turn **ON** the Local and/or Remote Loop.
- Confirm/set the BER pattern generator to **2047**.
- Zero out the local and remote Errored Seconds counters.
- Zero out the seconds/test counter.
- Inject errors to confirm test configuration.



Testing in 56/64 kbps DDS Mode

This section discusses the various tests available for the AS56 and AS56^{Plus} in 56/64 kbps DDS mode.

Local Loop

When the **Local Loop** is **ON**, the front panel **LP** LED will illuminate and local testing can be performed by external DTE equipment or by Access System 56's internal BERT

WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP "OFF".

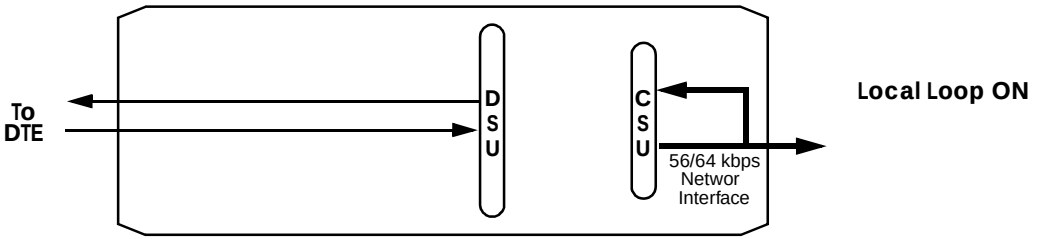
From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *and* **DOWN** *as required to display:*

```
NI Diagnostics
_Local Loop..:_On
```

SELECT as required to turn the Local loop off or on.



CSU Loop

The CSU Loop is useful for looping back any testing initiated by the other end of a point-to-point circuit. Included in such testing would be any externally generated testing.

WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP "OFF".

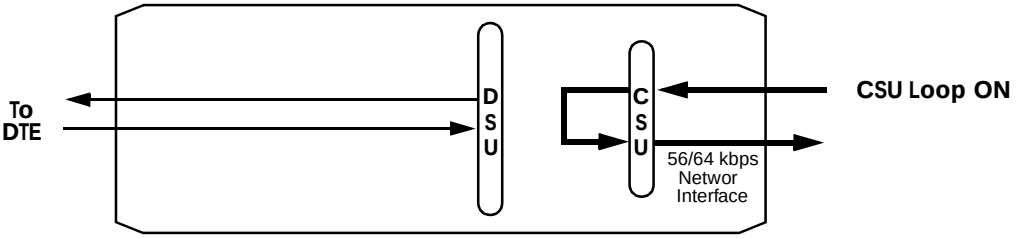
From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *and* **DOWN** *as required to display:*

```
NI Diagnostics
CSU Loop..:_On
```

SELECT as required to turn the CSU Loop Off/On.



DSU Loop

The DSU Loop is useful for looping back any testing initiated by the other end of a point-to-point circuit. DTE data is also looped back to its source.

WHEN TESTING IS COMPLETED, BE SURE TO TURN THE LOOP "OFF".

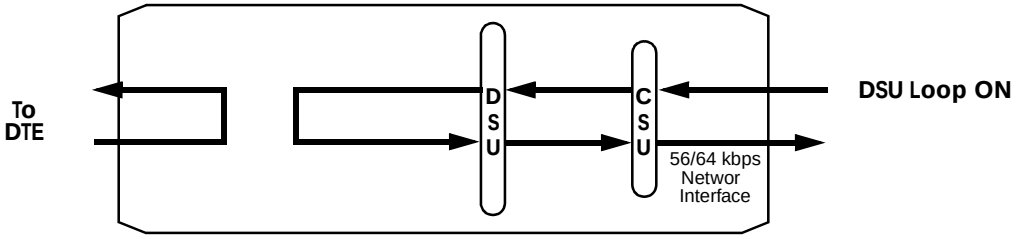
From Diag. Menu, **UP/DOWN** *to display:*

```
Diagnostics
_Ntwk Port
```

SELECT *and* **DOWN** *as required to display:*

```
NI Diagnostics
DSU Loop..:_On
```

SELECT as required to turn the DSU Loop Off/On.



Chapter

5

Other Features

Many other functions are available in the Access Sy stem56. This chapter describes access from the front panel display. The same functions can also be accessed via an externally attached terminal. See Chapter 6, *AuxiliaryPorts*.

Alarms and Statistics

This section discusses the alarms and statistics available in T1/FT1 mode and 56/64 kbps DDS mode.

T1/FT1 mode

The **Alarms and Stats** Main Menu is intended for those users with T1 alarm and ESF (Extended Superframe) statistics knowledge. From the **Alarms and Stats** Main Menu, **SELECT** then use **UP/DOWN** arrows to:

- Access current network alarm conditions, which are shown with the number of seconds that the alarms have been present since the last alarm reset.
- Reset the alarm times.
- Access both current and 24-hour ESF statistics.
- Access the current ESF registers.
- Send alarms to an externally attached printer. See Chapter 6, *Auxiliary Ports.*
- Send ESF statistics to an externally attached printer. See Chapter 6, *Auxiliary Ports.*

56/64 kbps DDS mode

The **Alarms and Stats** Main Menu is intended for those users with 56/64 kbps DDS alarm knowledge. From the **Alarms and Stats** Main Menu, **SELECT** then use **UP/DOWN** arrows to:

- Access current network alarm conditions, which are shown with the number of seconds that the alarms have been present since the last alarm reset.
- Reset the alarm times.
- Send alarms to an externally attached printer. See Chapter 6, *Auxiliary Ports*.

Alarm Definitions

This section discusses the alarm definitions that apply to T1/FT1 mode and 56/64 kbps DDS mode.

T1/FT1 mode

AIS. An unframed “all ones” condition has been detected.

LOS. Loss of Signal. At least 32 consecutive zeroes have been received at the network interface.

Red Alarm. A “loss of frame alignment” has occurred and synchronization has been lost.

Yellow Alarm. A Yellow Alarm is generated by the network and sent to the customer premises. It usually means that the network is not receiving the Access Syste m56 unit’s signalling correctly.

Framing Errors. One or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.

CRC6 Alar m One or more CRC6 block errors have been detected. The D4 framing does not include CRC6; the Access Sy stem56 unit replaces that parameter by counting the number of framing bit errors. The result is a useful picture over time regarding D4 link performance.

BPV. Bipolar Violations have been detected. This usually indicates that a very weak or overly strong signal is being received from the network or the cabling has been compromised.

56/64 kbps DDS mode

LOS. Loss of Signal. Received from network port.

OOS Out of Service. Received from network port.

OOF . Out of Frame. Received from network port.

CMI. Control Mode Idle. Received from network port.

Ferr. Framing Errors. One or more frame alignment bit errors have been detected. This does not mean that synchronization has been lost.

BPV. Bipolar Violation. This usually indicates that a very weak or overly strong signal is being received from the network or the cabling has been compromised

DLOS. DTE Loss of Signal. Unit has determined that the Serial Port is in a Loss of Signal state.

ESF Statistics Definitions (T1/FT1 Mode)

Errored Second (ES). Any occurrence of a Loss of Frame or a CRC6 error in a one-second period.

Failed Signal State (FSS). Ten consecutive Errored Seconds.

Failed Second (F S) ach second during the occurrence of a Failed Signal State.

Severely Errored Second (SES). Three hundred twenty (320) or more CRC6 errors in a one-second period.

Bursty Errored Second (BES) More than one but less than 320 CRC6 errors in a one-second period.

Loss of Frame Count (LOFC) Quantity of times that a Yellow Alarm has occurred.

Alarms/Statistics Menu (T1/FT1 Mode)

Please refer to Alarm and ESF Statistics Definitions previously described in this chapter.

This chapter describes front panel access of the Alarms and Statistics storage. Please refer to Chapter 6, *Auxiliary Ports* for terminal access.

From the **Alarms/Stats** Main Menu, **SELECT** then use **UP/DOWN** arrows to display either **NI Alarms** or **ESF Statistics**. Then **SELECT** followed by **UP/DOWN** as described below.

NI Alarms will display the current status(Yes/No) of AIS, Red and Yellow Alarms, Frame Errors (Ferr), CRC6, LOS, and BPV alarms. **UP/DOWN** will scroll through the seven possible alarms. If any entry is **yes**, the display will also indicate the quantity of seconds that the alarm has been present.

If **ESF Statistics** is selected, the user is then presented with another choice, **Current Statistics**, **24-Hour Statistics**, or **ESF Registers**.

By choosing **Current Statistics**, the user is provided statistics for the current time interval (maximum fifteen minutes). Use **UP/DOWN** to scroll through the following:

- Current Status
- ES & FS
- SES & BES
- LOFC
- Time in Current Interval (in seconds)
- the current quantity of **Valid Intervals** (fifteen minutes per interval).

In the **Current Status** screen (shown below), the following interpretation applies.

```
Current Stats
Status: XX0000X0
```

Digit #1	**F** or **0** where **F** indicates Failed Signal State (FSS).
Digit #2	**U** or **0** where **U** indicates that the T1 line is unavailable.
Digit #3	Always **0**.
Digit #4	Always **0**.
Digit #5	Always **0**.
Digit #6	Always **0**.
Digit #7	**L** or **0** where **L** indicates that the T1 line is in loop.
Digit #7	Always **0**.

Scrolling **UP/DOWN** will provide detailed information. Below is the **SES/BES** display.

```
Current Stats
SES: 000  BES: 000
```

By choosing **24 Hour Statistics**, the user can scroll through the ES, FS, SES, BES, and LOF counts for the preceding 24-hour period.

```
24 Hour Stats
SES: 00000
```

ESF Registers gives the ES, FS, SES, and BES counts broken down for each of the ninety-six 15-minute intervals in that 24-hour period. Use **UP/DOWN** to scroll through the intervals.

```
03. FS  SES BES
000 000 000 000
```

In this example, the user has scrolled to interval #3. The ES count is the first three-digit number (directly below the **03**).

Serial Port Indicators

This section discusses the various serial port indicators available in T1/FT1 mode and 56/64 kbps DDS mode.

T1/FT1 mode

Within T1/FT1 Mode operation, the user is able to view the current status of the Serial Port control signals. From the **Diagnostics** Main Menu, **SELECT Ser Port Ind** and then use **UP/DOWN** arrows to scroll through the following control signals:

RTS. Request To Send

DTR. Data Terminal Ready

56/64 kbps DDS mode

Within 56/64 kbps Mode operation, the user is able to view the current status of the Serial Port control signals. From the **Diagnostics** Main Menu, **SELECT Ser Port Ind** and then use **UP/DOWN** arrows to scroll through the following control signals:

TXD. Transmit Data

RXD. Receive Data

CD. Carrier Detect

CTS. Clear To Send

RTS. Request To Send

DTR. Data Terminal Ready

Utilities

From the **Utilities** Main Menu, **SELECT** then use **UP/DOWN** arrows to:

- View Unit Type

  The unit type can only be *viewed* through the front panel but it can be *changed* through the terminal.

- Set Date and Time

  After selecting **Set Date/Time** from the Utilities Menu, use the **UP/DOWN** arrows to scroll through the parameter selections (hour, minutes, seconds, day, month, year) and **SELECT** to choose the parameter you wish to increment the time and date. **END** takes you back to the Utilities Menu.

- Edit Unit ID#.

  After selecting **Edit Unit ID** from the Utilities Menu, use the **UP/DOWN** arrows to move the cursor to the next digit of the ID number. **SELECT** increments each digit from 0-9. **END** takes you back to the Utilities Menu.

- Clear BRAM. This function clears all user-entered configuration parameters and returns the Access Syste m56 unit to the factory default condition. **USE WITH CAUTION**.

- Determine installed software level. **END** takes you back to the Utilities Menu.

- Configure Auxiliary NMS/Printer Port. See Chapter 6, *Auxiliary Ports*.

  Note: After selecting **NMS/Printer Port** from the Utilities Menu, use the **UP/DOWN** arrows to choose Mode, Speed, or Edit IP Address.

  - The options for Mode are SNMP NMS, Printer, or Disabled.
  - The options for Speed are 1200, 2400, 4800, 9600, and 19200.

  See Chapter 6, *AuxiliaryPorts*. **END** takes you back to the **Utilities** Menu.

Events

The Access Syst em56 constantly monitors for the occurrence of "events" such as alarms, test commands, and system resets. When an event occurs, a description with a time and date stamp is immediately sent out the printer port. The format and interpretation of printed events are shown on the next page.

In addition, the Access System 56 maintains a log of the most recent sixteen events and that log can be accessed by either the front panel controls and LCD panel or an externally attached terminal. Refer to Chapter 6, *Auxiliary Ports*, for terminal access of the Event Log.

From the **Event Log** Main Menu, **SELECT** then use **UP/DOWN** arrows to view the stored events and/or clear the log. (The log is cleared is **SELECT** is depressed when the screen displays **Clear Event Log**.) The format of an LCD screen event is below. Interpretation of the events is the same as shown on the next page for printed events.

```
NN S Event Description
HH:MM:SS  MM/DD
```

NN is the Event sequence number **S** indicates that the Event is the **Start** of an occurrence. **E** is used to indicate that the Event is the **End** of an occurrence.

Event Printing

Following is a sample of an event format.

Format and Sample Entry

Unit ID	Seq. Num	Time	Date	Status	Event
0012345	01155	10:39:39	02/25	End	Port 1 LL

T1/FT1 Events

Type	Text	Description
System	UNIT START	Access Syst em56 power up or initialization sequence
	BRAM CLEAR	Non-volatile memory has been cleared
	CFG ERROR	Error detected in non-volatile memory
Alarm	NI RED	Network Interface is in Red Alarm
	NI AIS	Network Interface is receiving all “Ones”
	NI YEL	Network Interface is receiving Yellow Alarm
	NI CRC	Network Interface is experiencing CRC6 Errors
	NI LOS	Network Interface is in a Los of Signal condition
	NI FSS	Network Interface is in a Failed Signal State
	NI FERR	Network Interface is experiencing Framing Errors
Diagnostic	DTE LL	Serial Port is in Local Digital Loopback
	DTE RL	Serial Port is in Remote Digital Loopback
	NI LLB	The Network Interface is in Local Line Loopback
	NI RLB	The Network Interface is in Remote Line Loopback
	NI PLLB	The Network Interface is in Payload Loopback
	NI CSU LL	The Network Interface is in Local CSU Loopback
Indications	DTE CON	Serial Port is connected (DTR/RTS asserted)
	DTE DISC	Serial Port is disconnected

56/64 kbps DDS Events

Type	Text	Description
System	UNIT START	Access Syst em56 power up or initialization sequence
	BRAM CLEAR	Non-volatile memory has been cleared
	CFG ERROR	Error detected in non-volatile memory
Alarm	Net OOS	Unit is receiving Out of Service from the network
	Net OOF	Unit is receiving Out of Frame from the network
	Net CMI	Unit is receiving Control Mode Idle from the network
	Net Ferr	Unit is experiencing Framing errors
	Net LOS	Unit is in a Loss of Signal condition
Diagnostic	Net CSU Lp	Unit is in CSU Loopback
	Net DSU Lp	Unit is in DSU Loopback
	Remote Lp	Unit is in Remote CSU Loopback
	Lcl CSU Lp	Unit is in a Local CSU Loopback
Indications	DTE CONN	Serial Port is connected (DTR/RTS asserted)
	DTE DISC	Serial Port has detected Loss of Signal (disconnected)

Chapter

6

Auxiliary Ports

The Access Syst em56 includes two RS-232 “auxiliary” ports. The Console port allows the user to connect an external terminal (or PC with terminal emulation). The connected terminal can perform all the functions of the **UP**, **DOWN**, **SELEC** , and **END** buttons on the front panel. Usage of this terminal is highly recommended by Verilink as the CRT display is not constrained by the limitations of the LCD panel and, as a result, the user is presented with a more comprehensive indication of available choices and Access Syst em56 results.

The “SNMP” port is a dual function port. First, it allows the user to connect an external printer to obtain a hard copy of configuration, statistics, alarm and real-time events. Second, it enables an SNMP Network Management console to be connected to the unit. The Access System 56 unit is configurable for communicating with either one or the other, but not both.

Cabling

The table below provides a summary of the Verilink cables available for the Centum series.

Verilink Cable Number	Length	Shipped with Product	Description	Type of Cable
CBE 010-56001	15 ft.	Yes	8-pin to 8-pin modular Male-to-Male for network connection	Networ
CBE 020-09025	4 ft.	Yes	DE-9 male to DB-25 male for direct connection to mode	Management
458-501983-015	15 ft.	No	V.35 Male to Male, DCE to DTE	Application
458-501792-015	15 ft.	No	25D-type with RS-530 specification. Male-to-Male	Application
458-501776-015	15 ft.	No	V.35 Male-to-Male for external timin [a]	Application
458-501791-015	15 ft.	No	RS-530 Male-to-Male for external timing[a]	Application
Adapter Cables[b] (below)				
458-502361-015	15 ft.	No	25D-type (RS-530) Male to 37-pin (RS-449) Female	Application
458-502362-015	15 ft.	No	25D-type (RS-530) Male to 37-pin (RS-449) Male	Application
458-502363-015	15 ft.	No	25D-type (RS-530) Male to 37-pin (RS-449) Female for external timing[a]	Application
458-502364-015	15 ft.	No	25D-type (RS-530) Male to 37-pin (RS-449) Male for external timing[a]	Application

a. External Timing is the same as DSU-X, for a cross-over cable.

b. Adapter cables are used to convert between a 25-pin connector on the rear of the box to a 37-pin con nector on the customer apparatus.

For additional cable and pinout detail, see the following sections of this manual:

- Appendix A, *Standard Cabling for User Ports*
- Appendix B, *Special Serial Port Cabling*.

Auxiliary ports

Both auxiliary ports consist of 9-pin D-type female connectors. Because the ports are permanently DCE, there are two configurations for the required cabling, depending on whether the connections are “direct” or via modems.

The following cables are recommended:

CBE-020-09025. 9-pin D-type male to 25-pin D-type male for direct connection of a terminal or a printer. Four feet long. Cable is included.

CBE-021-09025 9-pin D-type male to 25-pin D-type male for direct connection of a modem. Four feet long. Cable is optional at extra cost.

Appendix A, *Standard Cabling for User Ports*, lists the pin assignments for the auxiliary ports.

Rear panel views

The two following figures show the rear panel views of the AS56^{Plus} and AS56, respectively. As an example, the AS56^{Plus} rear panel is labeled in detail.

Figure 6-1 Rear Panel of Access System 56^{Plus} T1 CSU/DSU

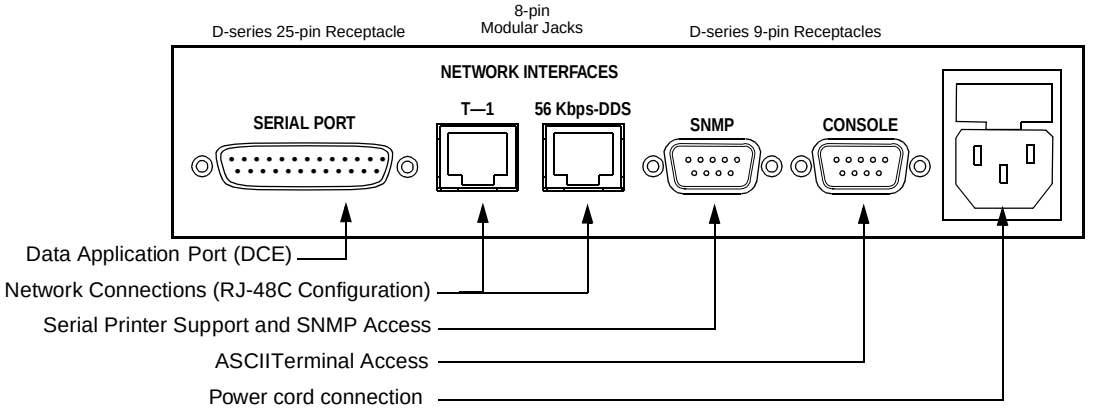
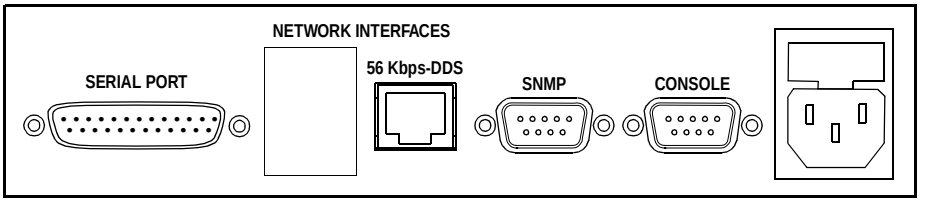


Figure 6-2 Rear Panel of Access System 56 CSU/DS



The serial port provides the following interface options:

- EIA 530 and RS-232 by direct connection
- RS-422/449 with a Verilink adapter cable, and
- V.35 with the adapter module shown in FigureA- 1, V.35 Adapter Module Pin Assignments on page A-4.

Terminal Configuration

Before connecting the terminal set it to 1200, 2400, 4800 or 9600 bps and 8-1-N (eight data bits, one stop bit, no parity). Configure/set the terminal to provide RTS high at all times.

To operate:

1. Connect the terminal to the Access System56's “Console” port using the CBE-020-09025 cable.

2. Apply power to the AS56 unit and ensure that it performs its initialization cycle successfully and displays the Main Menu on the front panel LCD display.

3. Apply power to the terminal, allow it to complete its initialization cycle and depress <CR>. The unit will respond with the following text:

```
==>
Verilink Corporation
Connected @9600bps
Enter password followed by carriage return:
==>
```

4. Enter the default password, <CR>. The unit will respond with the Terminal Selection Menu.

```
Verilink Corporation
Access System 56 Product Series
Terminal Selection Menu

    (A) A.D.D.S. Viewpoint     (B) A.D.D.S  Regent 25
    (C) Data General DASHER    (D) Datamedia 1521
    (E) Datamedia EXCEL 30     (F) DEC VT-52
    (G) DEC VT-100/131/220     (H) IBM 3101
    (I) Datamedia EXCEL 42     (J) FREEDOM 100
    (K) ICL 6401               (L) L.S.I. ADM 11, 31
    (M) Qume QVT-102, 108      (N) Televideo 900 Ser.
    (O) Wyse WY-50             (P) Paradyne 7811
    (Q) Teletype 5410, 5425    (R) ATTIS 4410, 4425

==> Enter Terminal Selection..
```

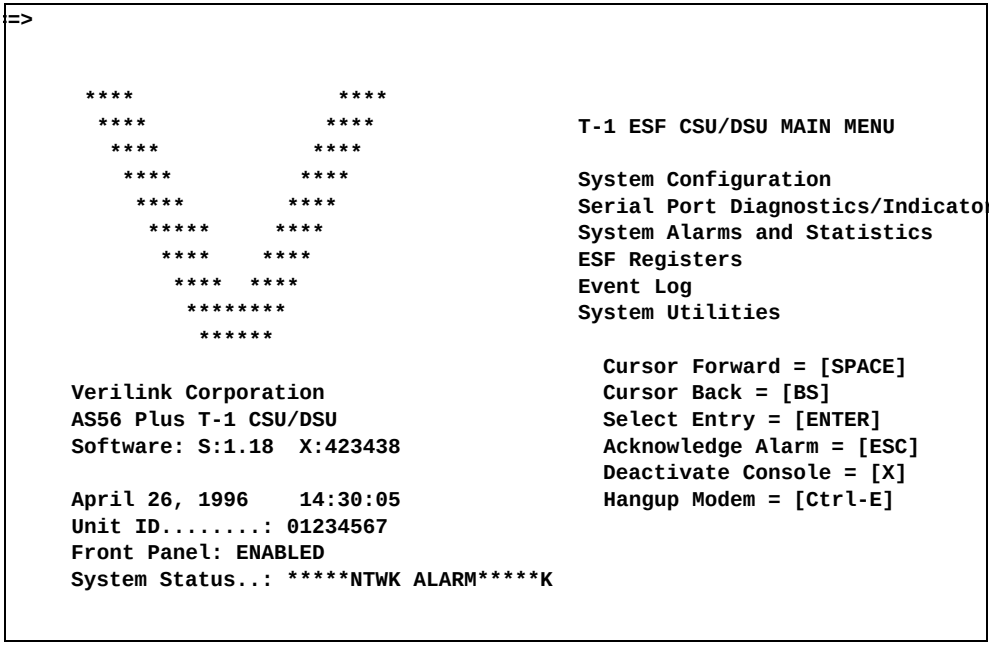
The Utilities Menu can be used to change the password.

The auxiliary ports depend on RTS from a terminal (or CD from a modem) to indicate a connected device. Every time that RTS (or CD) is lowered and subsequently raised, the unit assumes the possibility that a different terminal has been attached and will again present the user with the password entry screen.

After selecting a terminal type, the user is presented with a Main Menu on the CRT screen and is allowed access to all configuration, test and query functions provided by the Access System 56 unit.

Terminal Operation

Because the terminal functions are identical to the front panel functions previously described in this manual (except for a more comprehensive display), their descriptions are not repeated here. Instead, screen displays for the T1 ESF CSU and the DDS 56/64 kbps CSU are shown, beginning with the Main Menu below. The user is advised to peruse the CRT menus while reviewing the front panel descriptions. In all cases, **SPACE** advances the cursor, **BS** moves the cursor back, **ENTER** or **RETURN** selects an entry, and **ESC** acknowledges an alarm.



Selecting the operating mode

If you have purchased the AS56^{Plus} unit, you can select one of two network interface operating modes: T1/FT1 mode or 56/64 kbps DDS mode. Changing the operating mode can only be accomplished by using the ASCII console interface. Select the mode as follows:

1. From the Main Menu, select **System Utilities**. The following menu appears.

```
Verilink Corporation                                    April 26, 1996
AS56 Plus T-1 CSU/DSU                                        14:37:02
Unit ID: 01234567



                          System Utilities

                          Set System Time
                          Set System Date
                          Enter Unit Identification Number
                          Clear System Configuration
                          Configure Console and Printer Ports
                          Enter AutoDial Parameters
                          Enter Password
                          Disable Front Panel
                          Enter Unit IP Address

                          >>> Select Network Interface Type <<<


              Cursor Forward = [SPACE]   Select Entry = [ENTER]
              Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

From this menu, select >>> **Select Network Interface Type**<<<.

2. Select the desired **Unit Type**.

```
Verilink Corporation                                    April 26, 1996
AS56 CSU/DSU                                         14:37:02
Unit ID: 01234567



                  ***********************************************
                  *                                             *
                  * Unit Type: AS56 Plus CSU/DSU                *
                  *       (CR) to Select Type, (S)ave or (Q)uit *
                  *                                             *
                  ***********************************************
```

(CR) = AS56 Plus T-1 CSU/DSU or AS56 CSU/DSU

a. If you select **(S)ave**, the following appears on the screen:

```
**********************************************
*                                            *
* Unit Type: AS56 Plus CSU/DSU               *
*<<<<<      Are you sure??      >>>>>>        *
*            (S)ave or (Q)uit                *
**********************************************
```

b. If you select **(S)ave**, the following appears on the screen:

```
            <<<<<<<<<< W A R N I N G >>>>>>>>>>

You have CHANGED the NETWORK INTERFACE selection!!!
The digital service provided MUST MATCH the network interface!!

The unit will restart to activate the new interface.

The console will be disconnected..wait 3 seconds then...
Press [Enter] once or twice to re-establish the console connection.

You may CANCEL this operation NOW by pressing (Q)uit..

To complete the network interface change..press (Y)es
```

Configuration Menus

This section describes the systemconfiguration menus for T1/FT1 mode and 56/64 kbps DDS mode.

T1/FT1 mode

From the terminal's T1 Main Menu, the user has selected **System Configuration** and is presented with the following menu.

```
Verilink Corporation                                    April 26, 1996
AS56 Plus T-1 CSU/DSU                                        14:37:02
Unit ID: 01234567
                        SYSTEM CONFIGURATION

 Network (NI)                                      Serial Port Configurati
Configuration                                       Port #1

Framing...: D4                                  Speed....: 56K (1 DS0)
Line Code.: AMI                                 First DS0: 08
LBO.......: 0 db                                DS0 Order: Alternate DS0s
Density...: Clear                               Interface: V.35
NTWK Loops: Yes                                 DCD......: Off
Yellow Alm: Yes                                 Data.....: Inv
ESF Format: 54016                               Clock....: Norm
CRT Alarm.: Off                                 Timing...: Internal
                                                Rem Loop.: Enabled
System Clock
Source....: Int

            View DS0 Allocations = [V]
            Cursor Forward = [SPACE]   Next/Previous Entry = [ENTER]/[B]
            Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

From this menu, the user can view and/or change all Access Sy stem56 configuration parameters. Please refer to Chapter 3, *Configuring and Installing the Access Syst em56*, before changing any parameter(s).

By selecting **View DS0 Allocations**, the user can view all DS0 assignments on a single screen. This is the same function as *Checking the "T-Channels"*, on page 3-18.

Note that "Idle" refers to channels that have been configured as "Not Used" in the Access Syst em56.

```
Verilink Corporation                                    April 26, 1996
AS56 Plus T-1 CSU/DSU                                         14:37:02
Unit ID: 01234567

                      T-Channel (DS0) Allocation

                  DS0 #  Mode         DS0 #  Mode
                   01:   Idle          13:   Idle
                   02:   Idle          14:   Idle
                   03:   Idle          15:   Idle
                   04:   Idle          16:   Idle
                   05:   Idle          17:   Idle
                   06:   Idle          18:   Idle
                   07:   Idle          19:   Idle
                   08:   Port 1        20:   Idle
                   09:   Idle          21:   Idle
                   10:   Idle          22:   Idle
                   11:   Idle          23:   Idle
                   12:   Idle          24:   Idle

            Return to System configuration Menu + [X]
```

56/64 kbps DDS mode

From the terminal's DDS Main Menu, the user has selected **System Configuration** and is presented with the **System Configuration** menu.

```
     ****                ****
      ****              ****                 56/64 KBPS CSU/DSU MAIN MENU
       ****            ****
        ****          ****
         ****        ****                    System Configuration
          ****      ****                     System Alarms and Diagnostics
           *****    ****                     Serial Port Indicators
            ****   ****                      Event Log
             ****  ****                      System Utilities
              ********
               ******

                                               Cursor Forward = [SPACE]
   Verilink Corporation                        Cursor Back = [BS]
   AS56 CSU/DSU                                Select Entry = [ENTER]
   Software: S:1.18  X:423438                  Acknowledge Alarm = [ESC]
                                               Deactivate Console = [X]
   April 26, 1996    14:30:05                  Hangup Modem = [Ctrl-E]
   Unit ID.........: 01234567
   Front Panel: ENABLED
   System Status..: *****NTWK ALARM*****
```

From this menu, the user can view and/or change all AS56 configuration parameters. Please refer to Chapter 3, *Configuring and Installing the Access Sys tem56*, before changing any parameter(s).

```
Verilink Corporation                                          Feb 22, 1995
AS56 CSU/DSU                                                     14:37:02
Unit ID: 01234567
                        SYSTEM CONFIGURATION

 Network                                        Serial Port Configuration
Configuration

Speed.....: 56 Kbps                             Interface: V.35
Ntwk Diags: Yes                                 CD.......: On
Scrambler.: Yes                                 Data.....: Inv
DTE LOS...: None                                Clock....: Norm
CRT Alarm.: Off                                 Clocks...: Internal
                                                Rem Loop.: Enabld

Source....: Int

            Cursor Forward = [SPACE]   Next/Previous Entry = [ENTER]/[B]
            Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

Link Alarms and Diagnostics

This section discusses the link alarms and diagnostics for T1/FT1 mode and 56/64 kbps DDS mode.

T1/FT1 mode

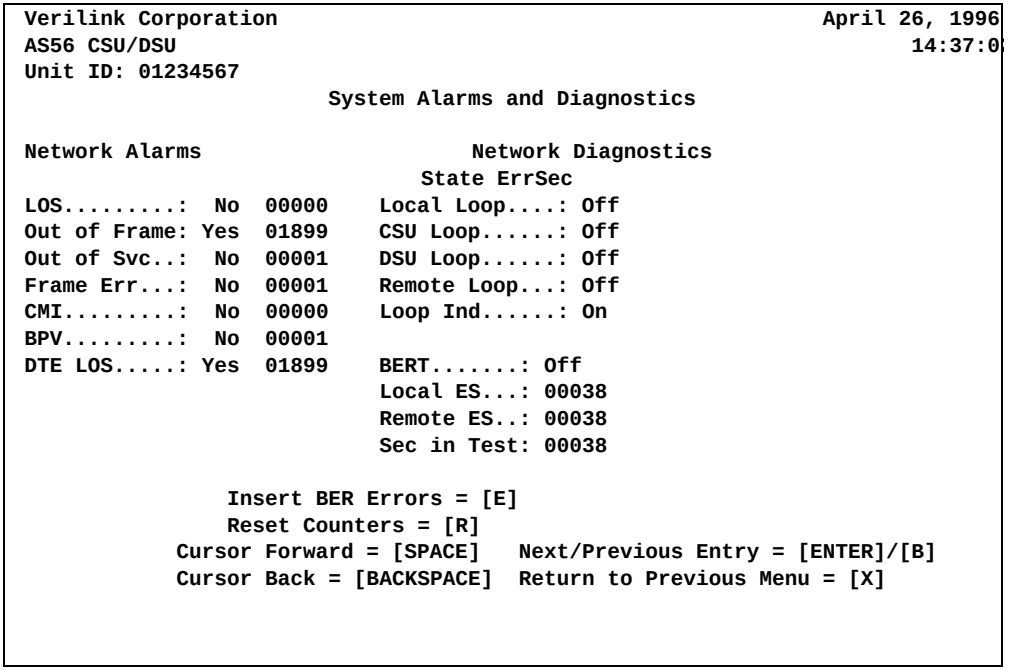
The user has selected **System Alarms and Diagnostics** from the terminal's T1 Main Menu and is presented with the menu depicted below. The network alarms and diagnostics are described in *Testing in T1/FT1 Mode* on page 4-2, *Alarms and Statistics* on page 5-1, and *Alarm Definitions* on page 5-3.

```
Verilink Corporation                                        April 26, 1996
AS56 Plus T-1 CSU/DSU                                            14:37:02
Unit ID: 01234567
                              System Alarms and Diagnostics

 Network Interface (NI)       Network Interface (NI)
       Alarms                  Diagnostics
       State  ErrSec
 AIS     No   00000          Local Loop.: Off
 Red    Yes   01899          NI LLB.....: Off
 Yel     No   00001          NI RLB.....: Off
 Ferr    No   00001          PAYLD Loop.: Off
 CRC6    No   00000
 BPV     No   00001          Loop Ind...: On
 LOS    Yes   01899          BER Pattern: 2047
                             BERT.......: Off   >> [E] to Insert BER Errors
                             Err Secs...: 00038
                             Sec/Test...: 00038

            Reset Counters = [R]
            Cursor Forward = [SPACE]   Next/Previous Entry = [ENTER]/[B]
            Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

56/64 kbps DDS mode

The user has selected **System Alarms and Diagnostics** from the terminal's DDS Main Menu and is presented with the menu depicted below. The network alarms and diagnostics are described in *Testing in 56/*

64 kbps DDS Mode on page 4-9, *Alarms and Statistics* on page 5-1, and *Alarm Definitions* on page 5-3.



Serial Port Diagnostics/Indicators

This section discusses the serial port diagnostics and indicators for T1/FT1 mode and 56/64 kbps DDS mode.

T1/FT1 mode

The user has selected **Serial Port Diagnostics/ Indicators** from the terminal's T1 Main Menu and is presented with the menu depicted below.

This menu provides the functions described in *Testing in T1/FT1 Mode*, on page 4-2. Also, see the description, *Alarms and Statistics*, on page 5-1.

```
Verilink Corporation                                        April 26, 1996
AS56 Plus T-1 CSU/DSU                                            14:37:02
Unit ID: 01234567

                    System Diagnostics & Indicators


         Serial Port

 Diagnostics                Indicators

Local Loop.: Off    Rx Data.: Off
Remote Loop: Off    Tx Data.: Off
BERT.......: Off    RTS.....: Off
                     DCD.....: Off
Local ES...: 00190  DTR.....: Off
Remote ES..: 00226  Loop Ind: Off
Sec in Test: 00001

               Depress [E] to insert errors in BER Test pattern.

                Cursor Forward = [SPACE]   Select Entry = [ENTER]
                Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

56/64 kbps DDS mode

The user has selected **Serial Port Indicators** from the terminal's DDS Main Menu and is presented with the menu depicted below. This menu provides the functions described in *Serial Port Indicator* , on page 5-8.

```
Verilink Corporation                                          April 26, 199
AS56 CSU/DSU                                                         14:37:
Unit ID: 01234567

                        Serial Port Indicators

                            Indicators

                        Rx Data.: Off
                        Tx Data.: Off
                        RTS.....: Off
                        DCD.....: Off
                        DTR.....: Off
                        Loop Ind: Off

            Cursor Forward = [SPACE]   Next/Previous Entry = [ENTER]/[B]
            Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

ESF Registers (T1/FT1 mode)

From the terminal's T1 Main Menu, the user has selected **ESF Registers** and is presented with the following menu.

```
Verilink Corporation                                        April 26, 1996
AS56 Plus T-1 CSU/DSU                                            14:37:02
Unit ID: 01234567

                          ESF Registers

                         ESF Statistics

   Register              Current  24 Hour
 Errored Seconds.........: 000    00000
 Failed Seconds (UAS)....: 201    01250
 Severely Errored Seconds: 000    00000
 Bursty Errored Seconds..: 000    00000
 Loss of Frame Count.....: 000    00001

 Time in Interval........: 201
 # Valid Intervals.......: 003
 ESF Status..............: FU000000

                     Display ESF Network Registers = [R]
                     Return to Previous Menu = [X]
```

The user can then proceed to this next menu for detailed information. These menus provide the functions described in *ESF Statistics Definitions (T1/FT1 Mode)*, on page 5-5.

```
Verilink Corporation                                        April 26, 1996
AS56 Plus T-1 CSU/DSU                                            14:37:02
Unit ID: 01234567

                          ESF Registers
     INT ES  FS  SES BES    INT ES  FS  SES BES    INT ES  FS  SES BES
     01. 000 900 000 000    17.                    33.
     02. 000 350 000 000    18.                    34.
     03. 000 000 000 000    19.                    35.
     04.                    20.                    36.
     05.                    21.                    37.
     06.                    22.                    38.
     07.                    23.                    39.
     08.                    24.                    40.
     09.                    25.                    41.
     10.                    26.                    42.
     11.                    27.                    43.
     12.                    28.                    44.
     13.                    29.                    45.
     14.                    30.                    46.
     15.                    31.                    47.
     16.                    32.                    48.
               Continue = [ENTER]        Return to Previous Menu = [X]
```

Event Log (T1/FT1 Mode and 56/64 kbps DDS mode)

From the terminal's T1 or DDS Main Menu, the user has selected **Event Log** and is presented with the sixteen most recent events stored in the Access Syst em56 unit (see below, and *Events* on page 5-10).

```
Verilink Corporation                                    April 26, 1996
AS56 Plus T-1 CSU/DSU                                         14:37:02
Unit ID: 01234567              EVENT LOG

Unit ID  Seq Num    Time     Date     Status         Event
01234567  13142    13:14:01  02/23    Start        BRAM Clear
01234567  13143    13:14:03  02/23    Start        Unit Start
01234567  13144    13:14:03  02/23    Start        NI     RED
01234567  13145    13:14:03  02/23    Start        NI     AIS
01234567  13146    13:14:07  02/23    Start        NI     LOS
01234567  13147    13:14:13  02/23    End          NI     AIS
01234567  13148    13:14:39  02/23    End          DTE 1   LL


              Clear Event Log = [C]        Reset Sequence Number = [R]
              Freeze Display = [F]         Return to Previous Menu = [X]
```

Utilities (T1 and 56/64 kbps DDS modes)

From the terminal's T1 or DDS Main Menu, the user has selected **System Utilities** and is presented with the screen depicted below. See *Utilities* on page 5-9, *Terminal Configuration* on page 6-5, and *Printer Configuration* on page 6-29.

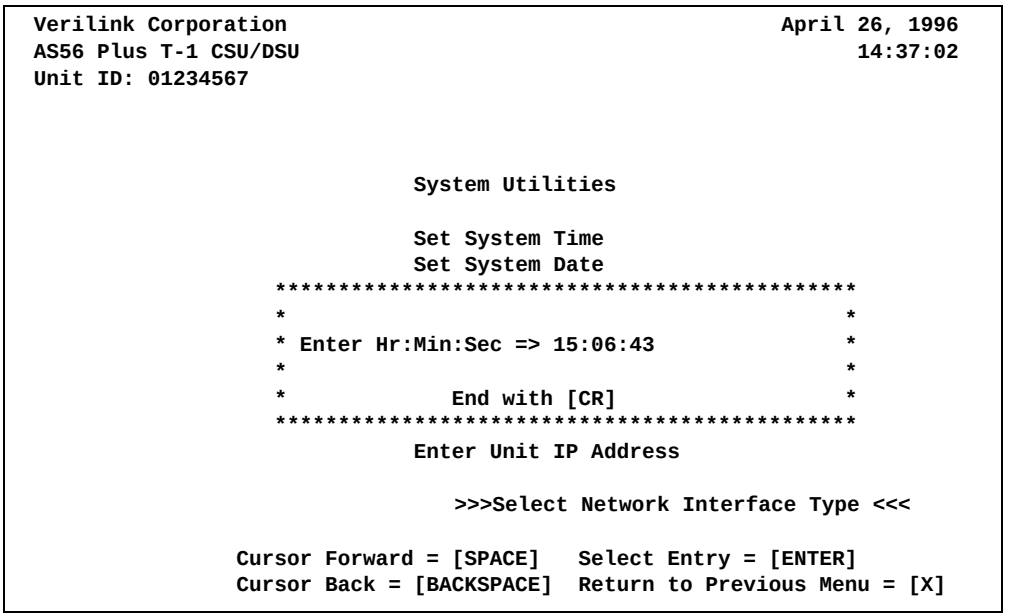
If you select **Disable Front Panel**, a message appears on the bottom of the System Utilities menu:

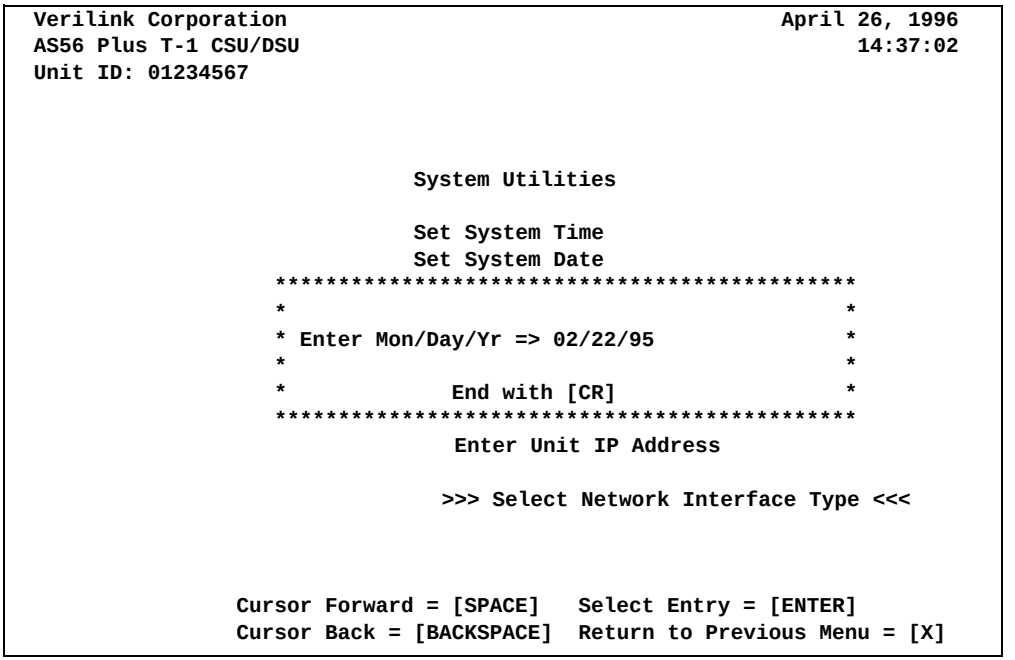
```
System Message: Front Panel has been
Disabled!
```

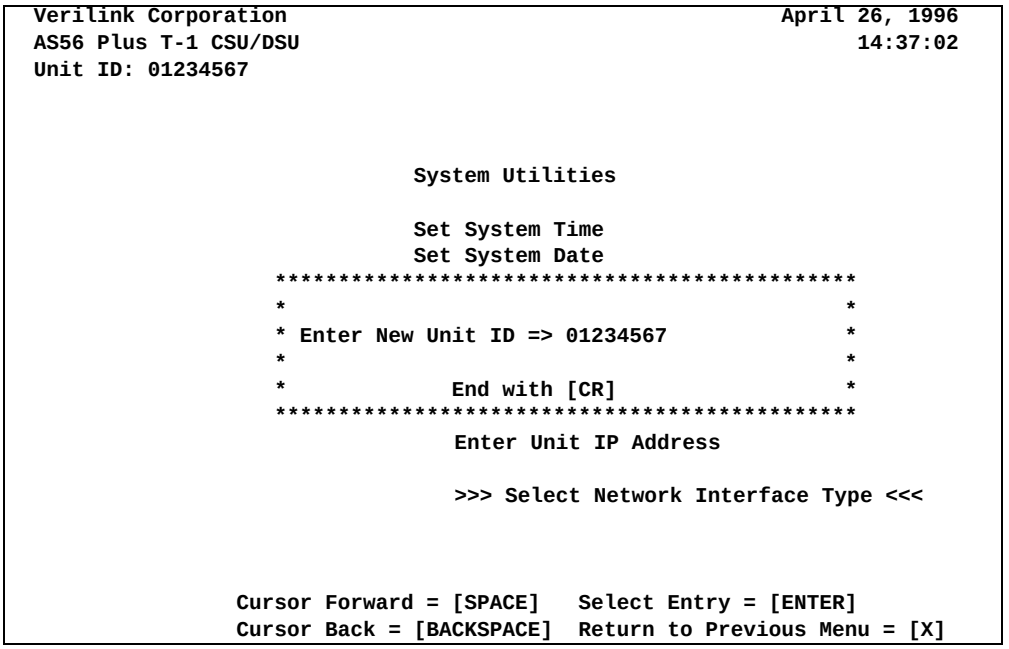
If you select **Enable Front Panel**, a message appears on the bottom of the System Utilities menu:

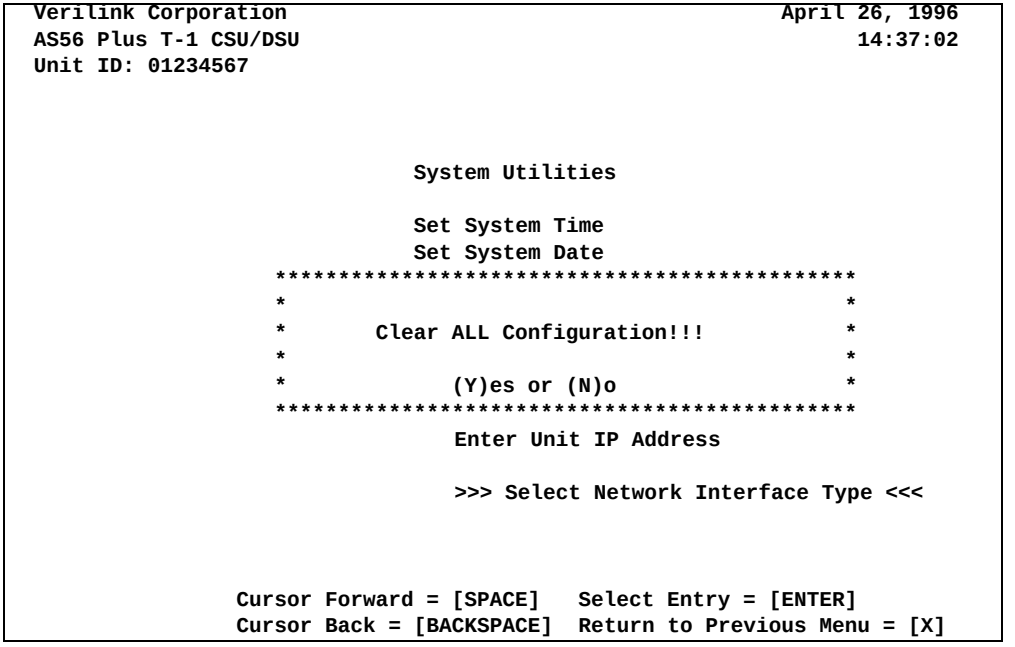
```
System Message: Front Panel now Enabled!
```

```
Verilink Corporation                                    April 26, 1996
AS56 Plus T-1 CSU/DSU                                        14:37:02
Unit ID: 01234567




                          System Utilities

                          Set System Time
                          Set System Date
                          Enter Unit Identification Number
                          Clear System Configuration
                          Configure Console and Printer Ports
                          Enter AutoDial Parameters
                          Enter Password
                          Disable Front Panel
                          Enter Unit IP Address

                          >>> Select Network Interface Type <<<


              Cursor Forward = [SPACE]   Select Entry = [ENTER]
              Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```

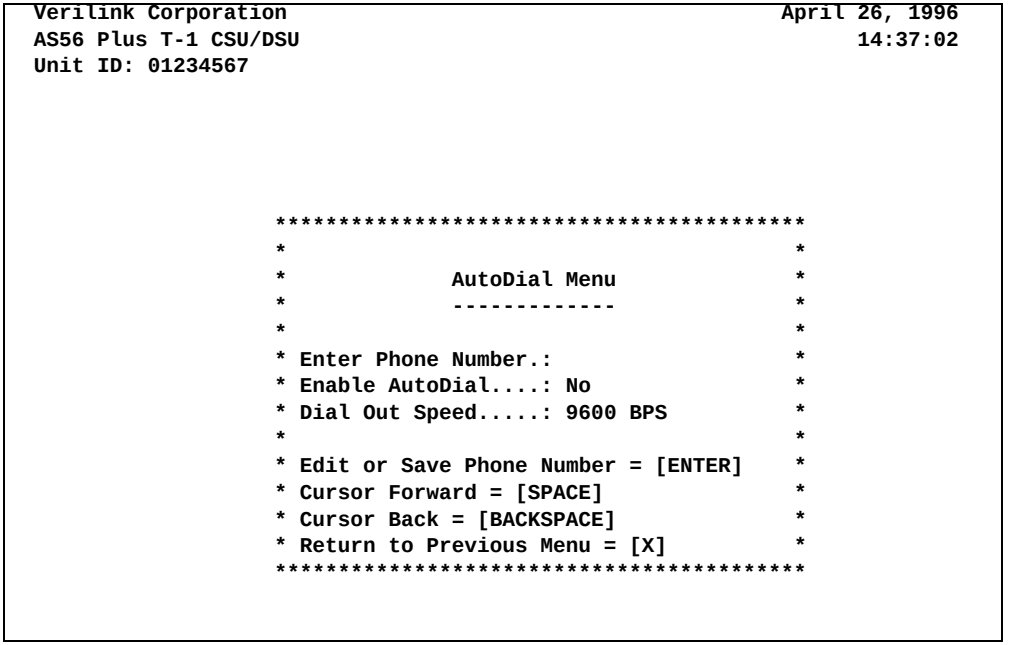

Verilink Corporation
April 26, 1996
AS56 Plus T-1 CSU/DSU
14:37:02
Unit ID: 01234567
System Utilities
Set System Time
Set System Date
* Enter Hr:Min:Sec => 15:06:43
End with [CR]
Enter Unit IP Address
>>>Select Network Interface Type <<<
Cursor Forward = [SPACE]
Select Entry = [ENTER]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]

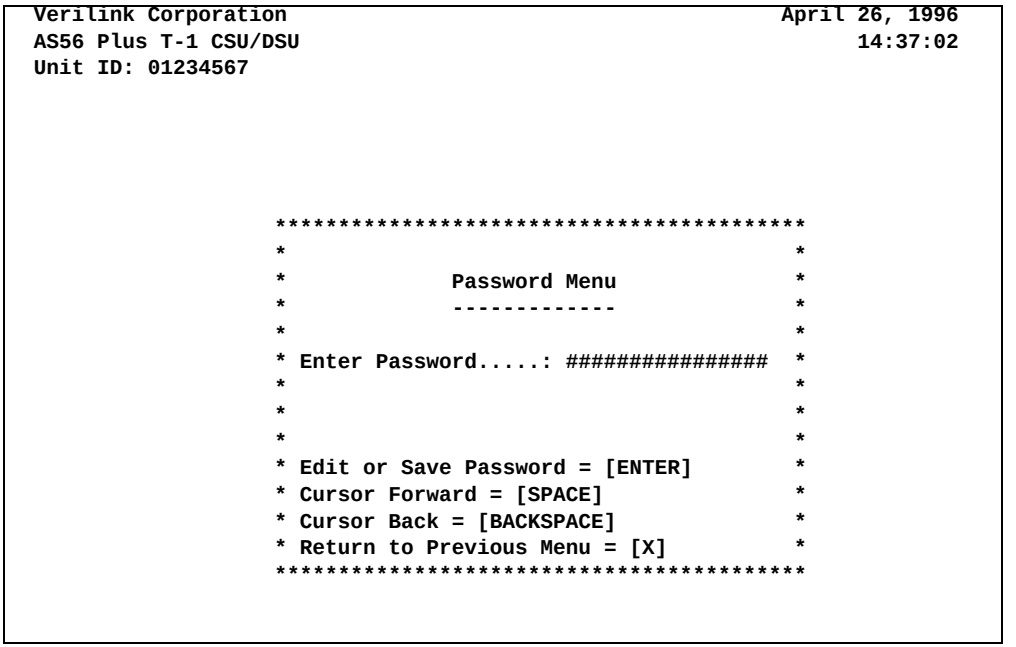

Verilink Corporation
April 26, 1996
AS56 Plus T-1 CSU/DSU
14:37:02
Unit ID: 01234567
System Utilities
Set System Time
Set System Date
* Enter Mon/Day/Yr => 02/22/95
End with [CR]
Enter Unit IP Address
>>> Select Network Interface Type <<<
Cursor Forward = [SPACE]
Select Entry = [ENTER]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]

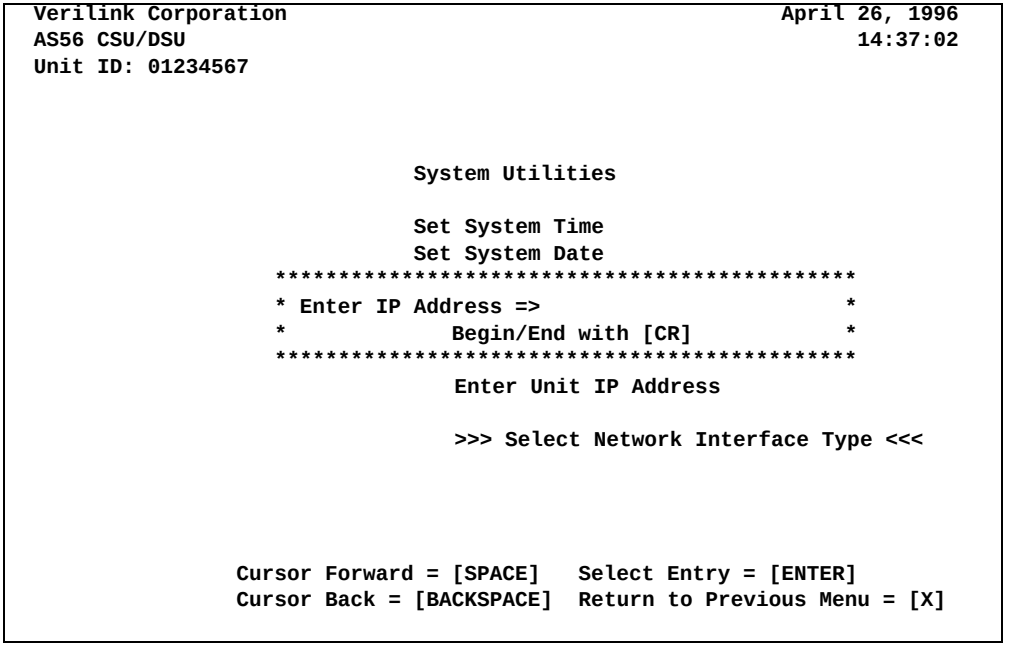

Verilink Corporation
April 26, 1996
AS56 Plus T-1 CSU/DSU
14:37:02
Unit ID: 01234567
System Utilities
Set System Time
Set System Date
* Enter New Unit ID => 01234567
End with [CR]
Enter Unit IP Address
>>> Select Network Interface Type <<<
Cursor Forward = [SPACE]
Select Entry = [ENTER]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]


Verilink Corporation
April 26, 1996
AS56 Plus T-1 CSU/DSU
14:37:02
Unit ID: 01234567
System Utilities
Set System Time
Set System Date
Clear ALL Configuration!!!
(Y)es or (N)o
Enter Unit IP Address
>>> Select Network Interface Type <<<
Cursor Forward = [SPACE]
Select Entry = [ENTER]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]

```
Verilink Corporation                                    April 26, 1996
AS56 Plus T-1 CSU/DSU                                        14:37:02
Unit ID: 01234567




              Console and Printer/NMS Port Configuration

              Console Port Speed....: Automatic Baud Rate Detection

              Printer/NMS Port Mode.: Connected to Printer
              Printer/NMS Port Speed: 9600 BPS




              Cursor Forward = [SPACE]   Select Entry = [ENTER]
              Cursor Back = [BACKSPACE]  Return to Previous Menu = [X]
```


Verilink Corporation
April 26, 1996
AS56 Plus T-1 CSU/DSU
14:37:02
Unit ID: 01234567
AutoDial Menu
Enter Phone Number.:
Enable AutoDial....: No
Dial Out Speed.....: 9600 BPS
Edit or Save Phone Number = [ENTER]
Cursor Forward = [SPACE]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]


Verilink Corporation
April 26, 1996
AS56 Plus T-1 CSU/DSU
14:37:02
Unit ID: 01234567
Password Menu
Enter Password.....: ################
Edit or Save Password = [ENTER]
Cursor Forward = [SPACE]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]


Verilink Corporation
April 26, 1996
AS56 CSU/DSU
14:37:02
Unit ID: 01234567
System Utilities
Set System Time
Set System Date
* Enter IP Address =>
* Begin/End with [CR]
Enter Unit IP Address
>>> Select Network Interface Type <<<
Cursor Forward = [SPACE]
Select Entry = [ENTER]
Cursor Back = [BACKSPACE]
Return to Previous Menu = [X]

Printer Configuration

To configure the auxiliary **NMS/Printer** port with a printer, use the unit's control panel to enter (**SELECT**) the **Utilities** menu. Use the **UP/DOWN** arrows to locate **NMS/Prt Port** and then **SELECT** again. If necessary, use the **UP/DOWN** arrows to locate **Mode**.

Repeatedly **SELECT** until the mode indicates **Printer**.

Use the **UP** or **DOWN** arrow to display **Speed** and then **SELECT** to choose the desired printer data rate. Finally, **END** twice to return to the Main Menu.

The printer should be configured for the same data rate as the unit's printer port and 8-N-1 character coding. All data is output with both a **CR** and an **LF** at the end of each line. Printer "word wrap" is unnecessary and the printer should not add an **LF** to each received **CR**.

Printer Port Flow Control

The unit's port supports simultaneous hardware and software flow control signaling from the attached device. The hardware control is RTS if connected directly to a printer or CD if connected via a modem. The software control is XOFF/XON. The XOFF is DC-3 (**CNTL**-**S**); however, any character arriving at the port is treated as an XON (to protect against a damaged DC-1).

Hardware control has priority; if RTS (or CD) is low, transmission to the device will be suspended and the data will be buffered in the AS56. Receipt of software flow control characters while RTS (or CD) is low will have no effect on the port. Transmission will be resumed when RTS (or CD) goes high.

If the port receives an XOFF while RTS (or CD) is high, transmission will be suspended and the data will be buffered. Transmission will be resumed if any subsequent character (including another XOFF) is received OR if RTS (or CD) is lowered and subsequently raised. This mechanism protects against a "lost" XON.

Printer Operation

Events are automatically sent (real-time) to the printer. See *Events* on page 5-10. Other print functions are available from both the front panel and the external terminal.

Front panel operation

From the Main Menu, **SELECT** the **Configuration** menu and use the arrow buttons to display **Print Config**. Then **SELECT** to initiate a printout.

From the Main Menu, **SELECT** the **Alarms/Stats** menu and use the arrow buttons to display either **Print Alarms** or **Print ESF Stats**. Then, **SELECT** to initiate a printout.

Terminal operation

Terminal control provides a much more comprehensive printing capability with CRT formatting: entering a **P** on the appropriate screen will cause a printout of **Configuration**, **DS0 Assignments**, **Link Statistics**, **Alarms**, **ESF Register Summar** , and **Complete ESF Register Contents**.

NMS (SNMP) Configuration

The **NMS/Printer** port can be connected to an SNMP network management station such as HP OpenView (or Sun's NetManager) by either LAN or modem. Either method must support UDP/IP/SLIP over RS-232.

Either of two methods can be used to connect the unit to the SNMP station. Both methods require UDP/IP/SLIP over RS-232. The most straightforward method is to connect the unit's NMS port to an intelligent port on a router, hub or terminal server. The intelligent port must be configured to run SLIP protocol. The port speed must be set as well as the IP address for the port and the port's remote device (in this case, the Access Syst em56 unit). Samples of these connections are illustrated in *Providing SNMP Manager Access*, on page 6-33.

An optional method allows the SNMP Manager to access the unit's product without a server. This is accomplished via a direct or dial connection over an RS-232 port on the SNMP station. The SNMP Network Management System must support UDP/IP/SLIP over the asynchronous serial link. This connection is illustrated in Fig u re6-5, SNMP Manager Access via Direct or Dial-up Connection on page 6-35.

Front Panel Operation

To configure the auxiliary **NMS/Printer** port for an SNMP device, **SELECT** the **Utilities** menu. Use the **UP/DOWN** arrows to locate **NMS/Prt Port** and then **SELECT** again. If necessary, use the **UP/DOWN** arrows to locate **Mode**.

Repeatedly **SELECT** until the mode indicates **SNMP/NMS**. Use **UP/DOWN** arrows to locate **Speed** and then **SELECT** to set port data rate.

Use **UP/DOWN** arrows to locate **Edit IP Address** and then **SELECT** to enter correct address. **END** twice to return to the Main Menu.

Terminal Operation

Perform the following procedure:

1. From the Utilities Menu, select **Configure Console & Printer Ports**.

a. Set the Printer/NMS Port Mode to **Connected to AS56**.

b. Set the Printer/NMS Port Speed to the desired speed (options are 1200, 2400, 4800, 9600 and 19200 bps).

c. Return to the Utilities Menu by pressing **X**.

2. Select **Enter Unit IP Address** from the Utilities Menu.

3. Enter the IP address.

Compiling the MIB

After the unit has been connected to the SNMP management station by one of the methods described above, the unit may be "pinged" to ensure connectivity. The Centum 56 Series product can be managed after a successful "ping" test.

The unit's SNMP agent is equipped with MIB-II and the RFC-1232 DS1 MIB. These may be managed without any MIB compilation. However, to manage the device fully, the Verilink Centum 56 Series MIB must be installed. The MIB is supplied on a 3.5" DOS floppy (file names: **vercsu1.mib** and **vercsu4.mib**).

The MIB file must be copied onto the management station's hard disk and then compiled. This task will be different depending on which management software being used. A MIB browse function must be present. If such is not the case, then a custom NMS application must be designed for the management platform.

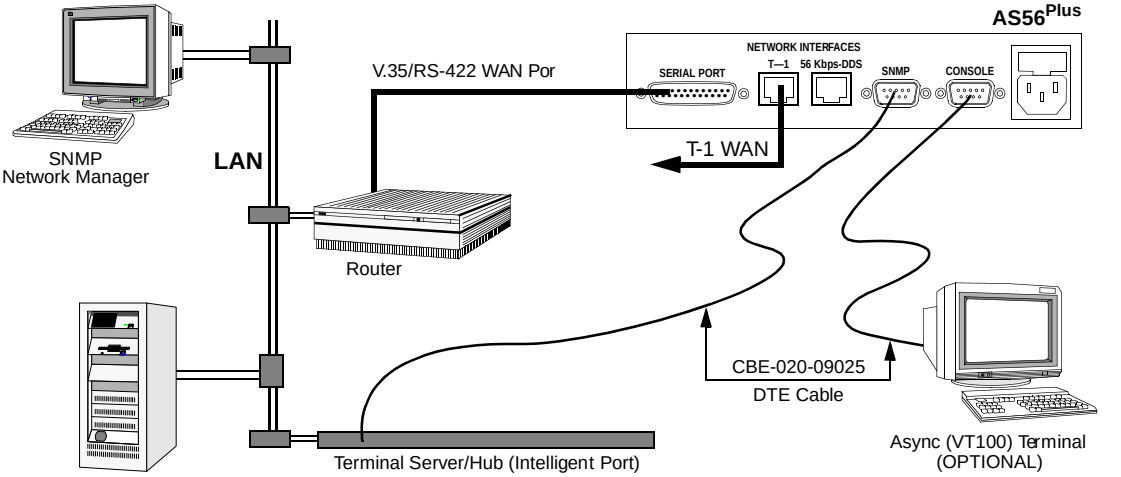
Providing SNMP Manager Access

This section describes how to provide SNMP Manager access with a terminal server, router, direct connection, or dial-up connection.

With a terminal server

In Figur e6-3, the terminal server is permitting Ac cessSy stem100 to access the LAN for SNMP management purposes. If multiple Access System 56 units are co-located, they all may access the LAN through the same server (using a multi-port server).

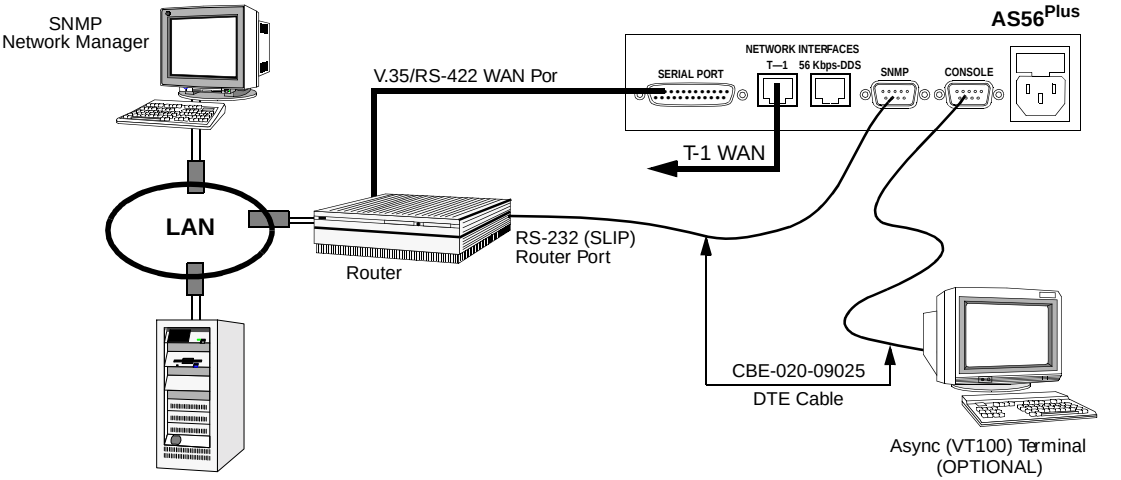
Figure 6-3 SNMP Manager Access with a Terminal Server



With a router

In Figur e6-4, an RS-232 (SLIP) port on the router is permitting Access System 56 to access the LAN for SNMP management purposes.

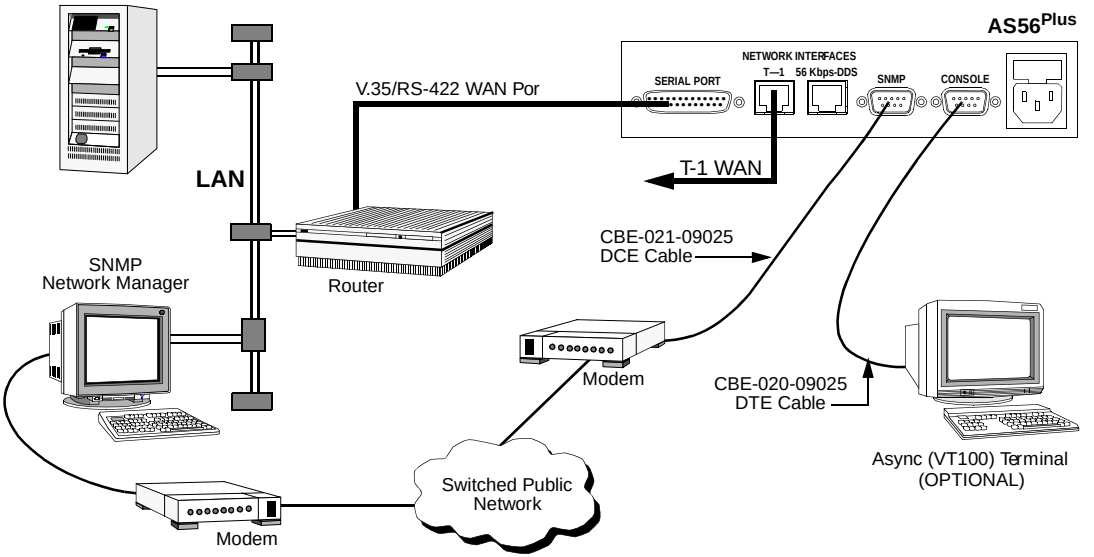
Figure 6-4 SNMP Manager Access with a Router



Via direct or dial-up connection

Another method allows the SNMP Manager to access the Access System 56 without the terminal server. This is by way of a direct or dial-up connection over an RS-232 port on the SNMP management station. The SNMP Network Management System must support UDP/IP/SLIP over the asynchronous serial link. This connection is diagrammed in Figur e6-5.

Figure 6-5 SNMP Manager Access via Direct or Dial-up Connection



Appendix

A Standard Cabling for User Ports

Network Interfaces

The T-1 and 56/64 kbps DDS Network Interfaces both use an 8-pin modular jack in an RJ-48 configuration. The figures to the right show the pin numbering and the pin assignments of the two jacks. The following cables are recommended:

CBE-010-56001 Dual purpose 8-position, 8-pin male/male modular cable (RJ-48 configuration). Used for connecting either the T-1 port to the supplier's T-1 network interface or the 56/64 kbps DDS port to the supplier's 56/64 kbps DDS network interface. Fifteen feet long. One cable supplied with unit. Additional cable optional at extra cost.

458-501766- **0** **0**Eight-position, 8-pin male/male modular cable (RJ-48 configuration with crossover wiring). Normally used for connecting the T-1 ports for two Access Syste m56 units directly. Eight feet long. Optional at extra cost.

CBE-011-56641 Eight-position, 8-pin male/male modular cable (RJ-48 configuration with crossover wiring). Normally used for connecting the 56/64 kbps DDS ports for two Access Sys tem56 units directly. Fifteen feet long. Optional at extra cost.

T-1 Port (RJ48)		
Pin	**Signal**	**To/FromCentum 56 Series**
1	Receive (R1)	To
2	Receive (T1)	To
3	Not Used	-----
4	Transmit (R)	From
5	Transmit (T)	From
6	Not Used	-----
7	Optional Shield Ground	-----
8	Optional Shield Ground	-----

56/64 kbps DDS Port (RJ48)		
Pin	**Signal**	**To/FromCentum 56 Series**
1	Transmit (T)	From
2	Transmit (R)	From
3	Not Used	----
4	Not Used	----
5	Not Used	----
6	Not Used	----
7	Receive (T1)	To
8	Receive (R1)	To

Multi-Configurable Serial Port

The Access Syst em56 Serial Port is a multi-configurable port in which the interface may be defined as either V.35, RS-530/RS-422A, or RS-232.

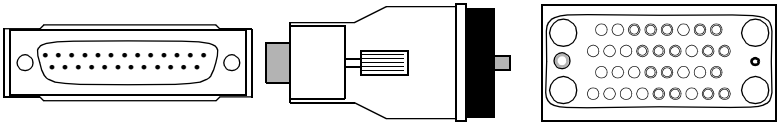
The serial port interface provides a DB-25 pin receptacle. The pin assignments for the serial port interface are listed below.

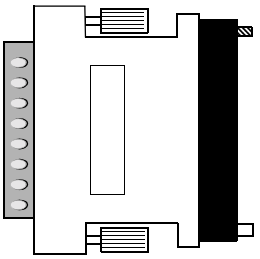
Pin	RS23	RS53	V.35
1	chassis	chassis	chassis
2	TXD out	TXD-	TXD-
3	RXD in	RXD-	RXD-
4	RTS out	RTS-	RTS-
5	CTS in	CTS-	CTS-
6	DSR in	DSR-	DSR-
7	signal gn	signal gnd	signal gnd
8	DCD i	DCD-	DCD-
9	(voltage+)	RXC-	RXC-
10	(voltage-)	DCD+	not used
11	not used	EXT TXC+	EXT TXC+
12	not used	TXC+	RXC+
13	not used	CTS+	TXD+
14	not used	TXD+	TXC+
15	TXC in	TXC-	TXC-
16	not used	RXD+	RXD+
17	RXC in	RXC+	RXC+
18	not used	not used	not used
19	not used	RTS+	not used
20	DTR out	DTR-	DTR-
21	not used	not used	not used
22	(RI)	DSR+	not used
23	not used	DTR+	not used
24	EXT TXC out	EXT TXC-	EXT TXC-
25	not used	not used	not used

V.35 Configuration

V.35 signaling is provided through a female DB-25 connector per the V.35 specification. With an external module, the same signals are provided through a female M-series, 34-pin connector. The tables that follow show the pin numbering and the pin assignments of the adapter module included with the product.

Figure A-1 V.35 Adapter Module Pin Assignments





DB-25 (Male)	Signal	34-Pin Winchester (Female)
1	Shield	A
2	TXD out A	P
3	RXD in A	R
4	RTS out	C
5	CTS in	D
6	DSR in	E
7	Signal Ground	B
8	DCD in	F
9	RXC in B	X
10	-	-
11	EXT CLK out B	W
12	TXC in B	a*
13	-	-
14	TXD out B	S
15	TXC in A	Y
16	RXD in B	T
17	RXC in A	V
18	-	-
19	-	-
20	DTR out	H
21	-	-
22	-	-
23	-	-
24	EXT CLK out A	U
25	-	-

* On AMP connectors, this pin is designated as “AA.”

RS-530/RS-422A Configuration

RS-422A Category I signaling is provided through a female DB-25 connector per the RS-530 specification. With an external adapter cable, the same signals are provided through a female DB-37 connector per the RS-449 specification. The tables that follow show the pin numbering and the pin assignments of the adapter cables. The following cabling is recommended:

458-501792-001 D-type 25-pin (DB-25) male connectors at both ends (in compliance with RS-530 specification). Straight-through. Fifteen feet long. Optional at extra cost.

458-502362-001 DB-25 to DB-37 (RS-530 to RS-449) adapter cable. The Access System 56 end is 25-pin male in compliance with RS-530 specification; the customer end is DB-37 female in compliance with RS-449 specification. Used with customer-supplied male/male DB-37 cable. Straight-through. Fifteen feet long. Optional at extra cost.

Figure A-2 RS-530/RS-422A Pin Assignments

Signal	RS530 DB-25	RS449 DB-37
Shield	1	-
TXD out A out	2	4
RXD in A	3	6
RTS out A	4	7
CTS in A	5	9
DSR in A	6	11
Signal Ground	7	19
DCD in A	8	13
RXC in B	9	26
DCD in B	10	31
EXT CLK out B	11	35
TXC in B	12	23
CTS in B	13	27
TXD out B	14	22
TXC in A	15	5
RXD in B	16	24
RXC in A	17	8
-	18	-
RTS out B	19	25
DTR out A	20	12
-	21	-
DSR in B	22	29
DTR out B	23	30
EXT CLK out A	24	17
-	25	-

RS-232 Configuration

When the Access Syst em56 Serial Port is set for RS-232, the port operates in compliance with the TIA/EIA RS-232 standards. The tables that follow show the pin numbering and the pin assignments of the adapter cables. The following cabling is recommended:

CBE-021-0053 0 DB-25 male connector DB-25 female connector Crossover. Fifteen feet long. Optional at extra cost.

Console Port

The Access Syst em56 Console Port allows the user to connect to an external terminal. The port provides a DE-9 receptacle.

SUPV Port (DB-9)	DCE
1	DCD out
2	RXD out
3	TXD in
4	DTR in (not used)
5	signal groun
6	DSR out
7	RTS in
8	CTS out
9	RI out (not used

SNMP Port

The Access Syst em56 SNMP Port is a dual function port. It allows the user to connect to an external printer and it enables an SNMP network management console to be connected to the unit. The port provides a DB-9 receptacle.

SNMP Port (DB-9)	DCE
1	DTR in
2	RXD out
3	TXD in
4	not used
5	signal groun
6	not used
7	CTS out
8	not used
9	not used

Both the Console port and the SNMP port are permanently DCE. There are two configuration for the required cabling, depending on whether the connections are “direct” or via modems. Verilink cabling is recommended.

CBE-020-09025 9-pin D-type male to 25-pin D-type male for direct connection of a terminal or a printer. Four feet long. Included with product.

CBE-020-09025 (CRT/Printer Cable)		
Signal	**DB-9**	**DB-25**
CD	1	8
RXD	2	3
TXD	3	2
DTR	4	20
GND	5	7
DSR	6	6
RTS	7	4
CTS	8	5
-	9	-

CBE-021-09025 9-pin D-type male to 25-pin D-type male for direct connection of a modem. Four feet long. Optional at extra cost.

CBE-021-09025 (Modem Cable)		
Signal	**DB-9**	**DB-25**
DTR	1	20
RXD	2	3
TXD	3	2
-	4	-
GND	5	7
-	6	-
CTS	7	5
-	8	-
-	9	-

Appendix

B Special Serial Port Cabling

External Timing

If “External” timing is required to satisfy a particular application, Serial Port #1 must be used (Worksheet Item #24) ***and*** Serial Port #1 must supply the master network timing (Worksheet Item #16). See *AS56 and AS56^{Plus} Worksheet*, on page 3-30.

External timing is used when the attached customer equipment is a DCE instead of a DTE. The DCE clock is delivered to the Serial Port’s External Clock input pins and drives the Access System 56 unit’s transmit function. See *Cables for External Timing*, on page B-2.

Cables for External Timing

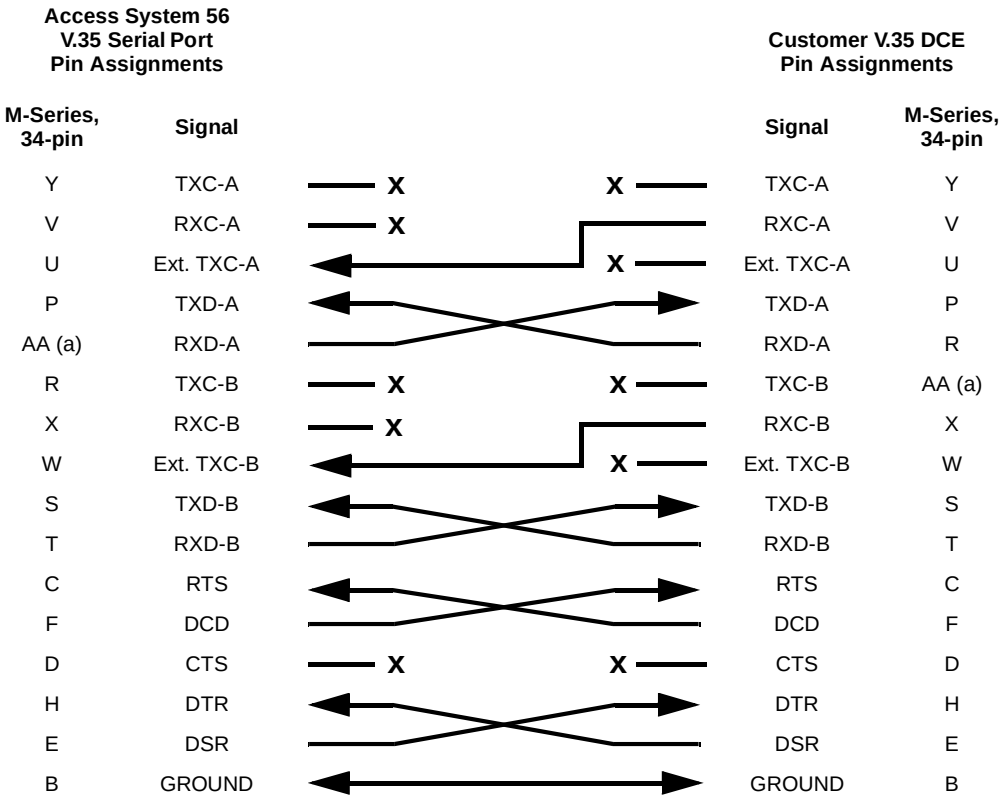
The figures in this section describe the crossover cabling necessary to support a V.35 and an RS-422A Serial Port #1 with External timing. Note that the cables are not symmetrical.

The Access System 56 units have female connectors and, therefore, the cable connectors are always male at the Access System 56 end. They will also be male at the customer end unless specified otherwise.

V.35 Serial Port Cabling

458-501776- **0** **1** V.35 cross-over cable. M-series, 34-pin male connectors at both ends. Fifteen feet long. Optional at extra cost.

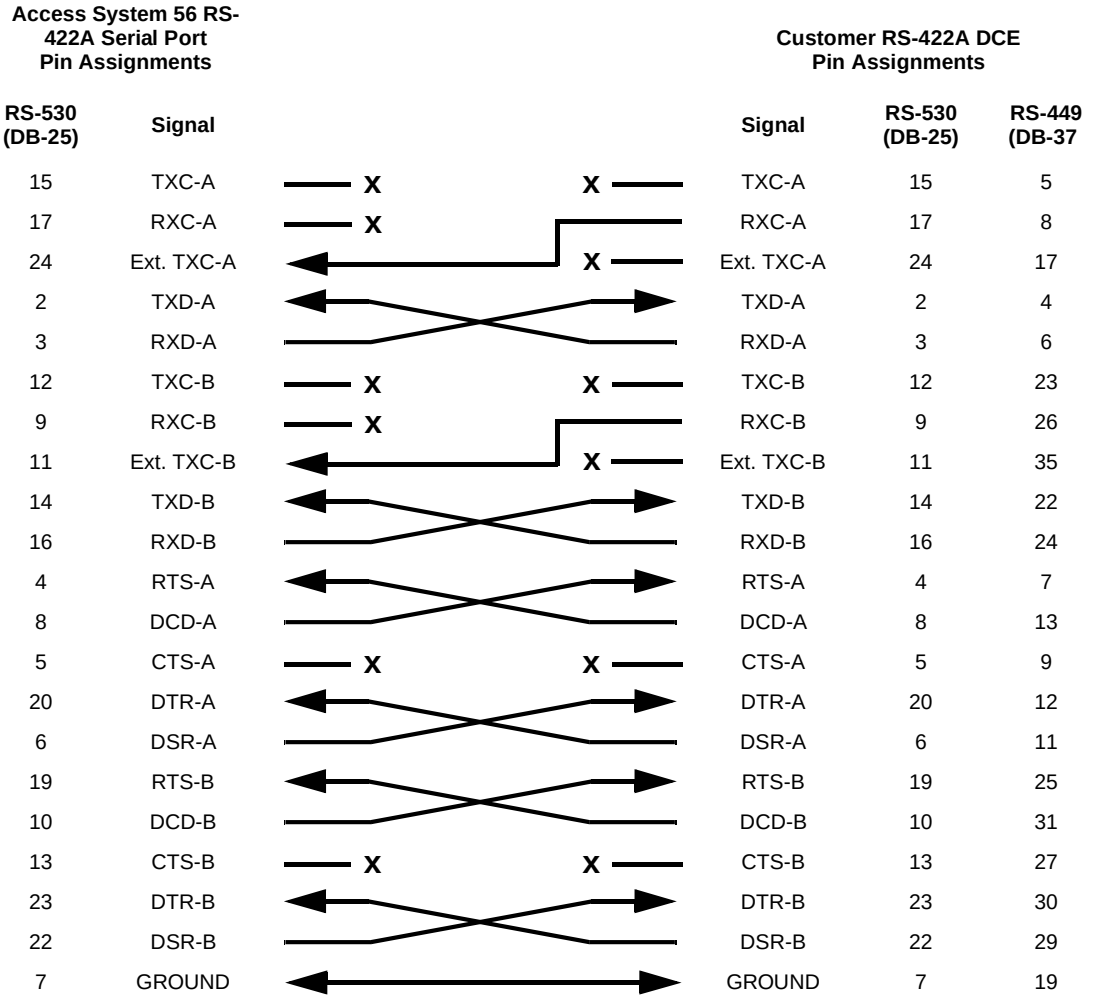
Figure B-1 V.35 Serial Port #1 Cabling for External Timing


Access System 56 V.35 Serial Port Pin Assignments
M-Series, 34-pin
Signal
Customer V.35 DCE Pin Assignments
Signal
M-Series, 34-pin
Y TXC-A TXC-A Y
V RXC-A RXC-A V
U Ext. TXC-A Ext. TXC-A U
P TXD-A TXD-A P
AA (a) RXD-A RXD-A R
R TXC-B TXC-B AA (a)
X RXC-B RXC-B X
W Ext. TXC-B Ext. TXC-B W
S TXD-B TXD-B S
T RXD-B RXD-B T
C RTS RTS C
F DCD DCD F
D CTS CTS D
H DTR DTR H
E DSR DSR E
B GROUND GROUND B

RS-422A Serial Port Cabling

458-501791-0 1 RS-530 cross-over cable. D-type, 25-pin (DB-25) male connectors at both ends. Fifteen feet long. Optional at extra cost.

Figure B-2 RS-422A Serial Port #1 Cabling for External TIming



458-502363-001 DB-25 to DB-37 (to RS-449) adapter cable. The Access System 56 end is 25-pin male in compliance with RS-530 specification; the customer end is DB-37 female in compliance with RS-449 specification. Used with customer supplied male/male DB-37 cable. Fifteen feet long. Optional at extra cost.

Adapter cables are available to convert 25D-type RS-530 to 37-pin RS-449. The following cables can be ordered from Verilink:

- 37-pin D-type (RS-530) male to 36-pin (RS-449) female
- 37-pin D-type (RS-530) male to 36-pin (RS-449) male
- 37-pin D-type (RS-530) male to 36-pin (RS-449) female for external timing
- 37-pin D-type (RS-530) male to 36-pin (RS-449) male for external timing

Cables for INTernal/EXTernal Timing

Please refer to items #16 and #24 on *AS56 and AS56^{Plus} Worksheet,* on page 3-30.

Internal/External timing is supported with standard straight-through cabling. In addition, the attached DTE must internally loop back its incoming Transmit Clock to its outgoing External Transmit Clock. If this cannot be done inside the DTE itself, the same function can be provided with cable jumpers (at the DTE connector). Contact factory if assistance is needed.

Figure B-3 V.35 Serial Port #1 Cabling for Internal/External Timing

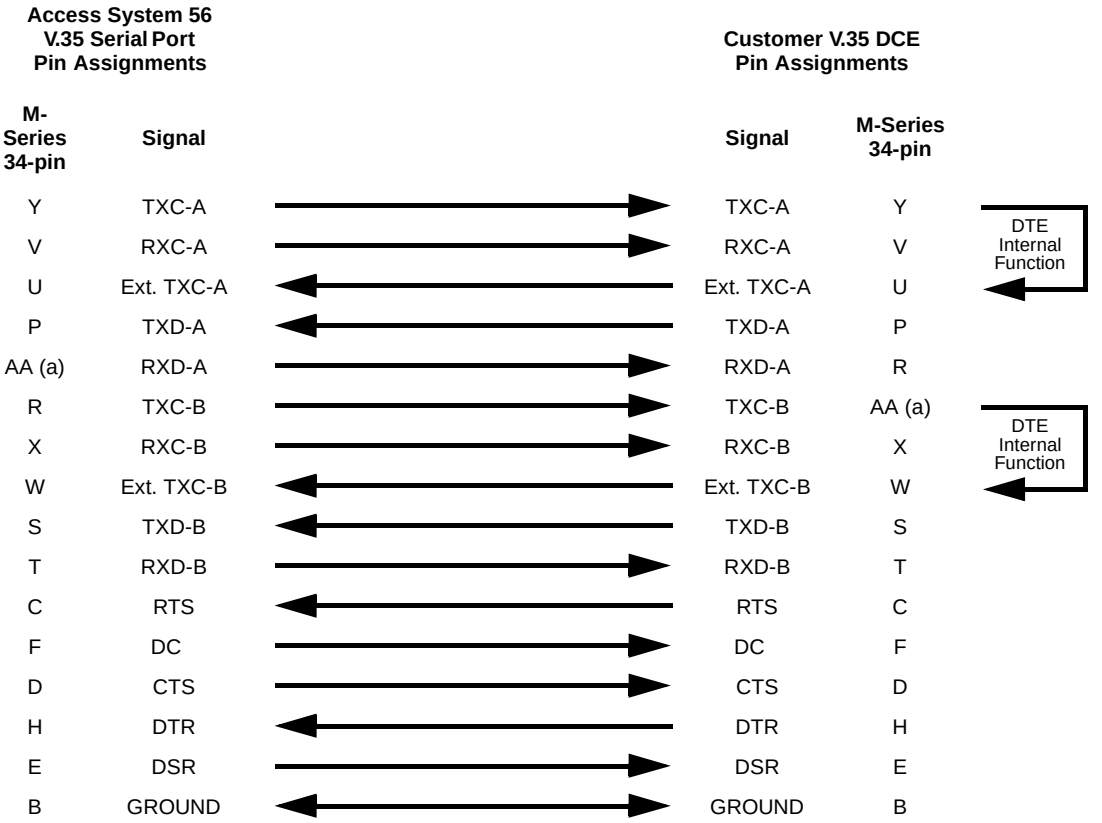
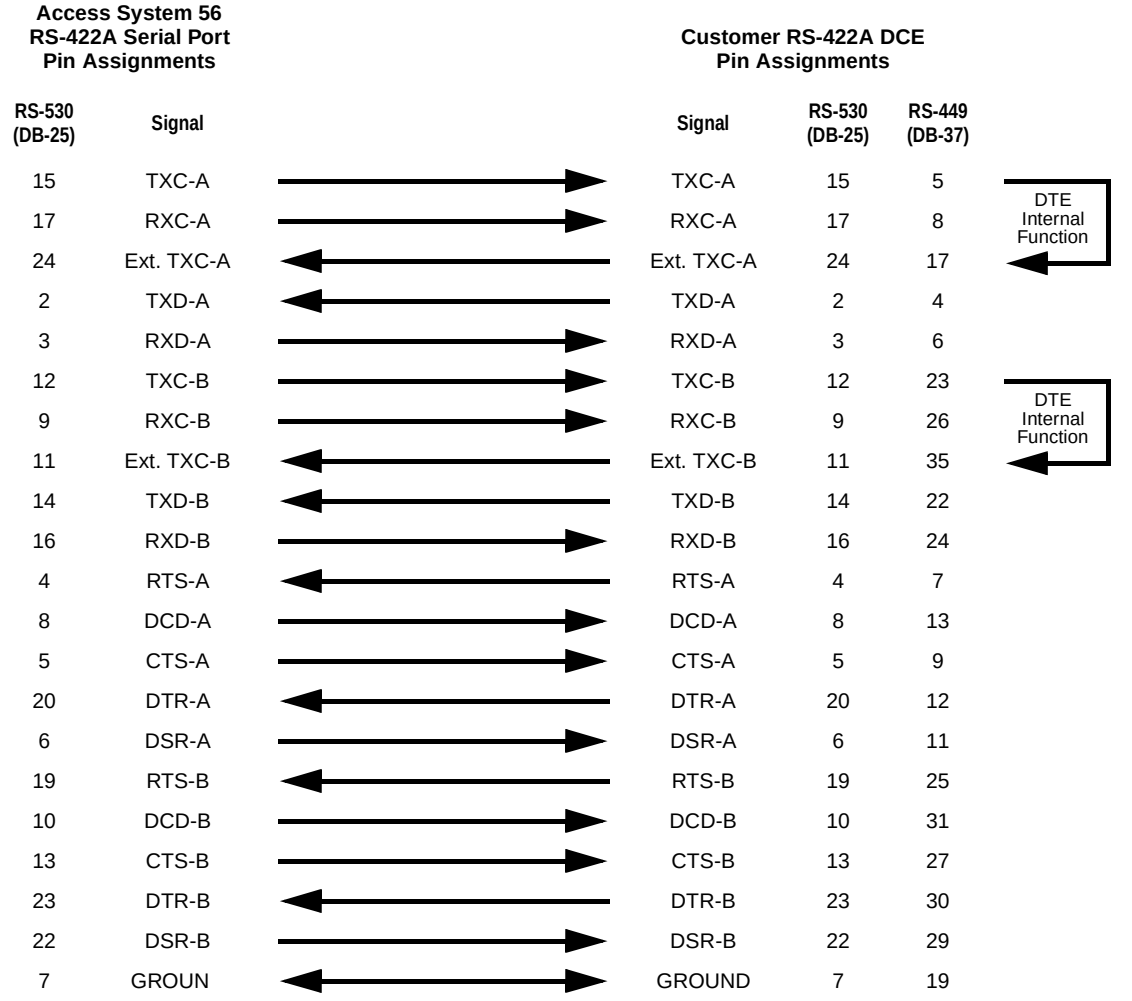

Access System 56 V.35 Serial Port Pin Assignments
Customer V.35 DCE Pin Assignments
M-Series 34-pin
Signal
Signal
M-Series 34-pin
Y TXC-A TXC-A Y
V RXC-A RXC-A V
U Ext. TXC-A Ext. TXC-A U
P TXD-A TXD-A P
AA (a) RXD-A RXD-A R
R TXC-B TXC-B AA (a)
X RXC-B RXC-B X
W Ext. TXC-B Ext. TXC-B W
S TXD-B TXD-B S
T RXD-B RXD-B T
C RTS RTS C
F DC DC F
D CTS CTS D
H DTR DTR H
E DSR DSR E
B GROUND GROUND B
DTE Internal Function
DTE Internal Function

Figure B-4 RS-422A Serial Port #1 Cabling for Internal/External TIming


Access System 56
RS-422A Serial Port
Pin Assignments
Customer RS-422A DCE
Pin Assignments
RS-530 (DB-25)
Signal
Signal
RS-530 (DB-25)
RS-449 (DB-37)
15 TXC-A TXC-A 15 5
17 RXC-A RXC-A 17 8
24 Ext. TXC-A Ext. TXC-A 24 17
2 TXD-A TXD-A 2 4
3 RXD-A RXD-A 3 6
12 TXC-B TXC-B 12 23
9 RXC-B RXC-B 9 26
11 Ext. TXC-B Ext. TXC-B 11 35
14 TXD-B TXD-B 14 22
16 RXD-B RXD-B 16 24
4 RTS-A RTS-A 4 7
8 DCD-A DCD-A 8 13
5 CTS-A CTS-A 5 9
20 DTR-A DTR-A 20 12
6 DSR-A DSR-A 6 11
19 RTS-B RTS-B 19 25
10 DCD-B DCD-B 10 31
13 CTS-B CTS-B 13 27
23 DTR-B DTR-B 23 30
22 DSR-B DSR-B 22 29
7 GROUN GROUND 7 19
DTE Internal Function
DTE Internal Function